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THE RAFFERTY-ALAMEDA BOARD OF INQUIRY

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Rafferty-Alameda
Board of Inquiry

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January 25, 1988

The Honourable H. J. Swan
Minister of Environment & Public Safety
302 Legislative Building
Regina, Saskatchewan
S4S 0B3

Dear Mr. Minister:

By Minister's Order dated July 27, 1987, we were appointed a Board of Inquiry to conduct informal public meetings to allow the public a reasonable opportunity to present tneir views on the proposed construction of Rafferty and Alameda dams. We have completed our Inquiry, and in accordance with the Minister's Order, now deliver to you a Report of our findings and recommendations, together with a transcript of the public meetings.

Yours truly,

Dr. John Brennan, Chairman.

Ms. Darla Hunter, Member.

Mr. Clarence Fleck, Member.

CHAPTER 1: THE INQUIRY PROCESS

BACKGROUND

The Souris River Basin in southeastern Saskatchewan has been considered a potential area for water control facilities for decades. The area is plagued with drought, yet has a history of destructive flooding that has made its impact felt as far south as Minot, North Dakota. Numerous studies have been conducted over the years, but it was not until the mid-1980's that a number of coincident events resulted in the birth of the Rafferty-Alameda project.

Briefly stated, these events are:

- identification of and emphasis on water as a development resource by the Government of Saskatchewan;
- the decision by the Saskatchewan Power Corporation (SPC) to build the Shand Power Station;
- the offer by the United States to contribute approximately $41 million (1985 U.S. dollars) in order to acquire flood protection for North Dakota.

In February 1986, Premier Grant Devine announced the government's intention, subject to regulatory and environmental approvals and the provision of U.S. funding assistance, to construct the Rafferty and Alameda dams on the Souris River and Moose Mountain Creek respectively. To conduct this project a Crown Corporation, the Souris Basin Development Authority (SBDA), was created on March 6, 1986, by Order-in-Council. The SBDA is responsible for planning and constructing the two dams and related facilities. As well, the Authority must ensure all regulatory, environmental and public concern issues are considered and addressed.

The first task of the Authority was preparation of an Environmental Impact Statement (EIS) which was filed on May 30, 1987 with the Department of Environment and Public Safety. The EIS is composed of a number of studies conducted to determine the social, economic and environmental impact of the project on the areas affected. The EIS also outlines measures that the SBDA proposes in order to mitigate the possible negative effects of this development.

The EIS was filed under the requirements of The Environmental Assessment Act which stipulates that an environmental assessment is required for those projects which may affect natural ecosystems; cause wastes which require a handling method not covered by statutory requirements; involve

a new technology which may have significant environmental implications; necessitate other developments which may have an impact on the environment, or be of widespread public concern. The guidelines for preparation of the EIS were provided to the SBDA by Saskatchewan Environment and Public Safety through two documents:

1) General Guidelines for the Preparation of an Environmental Impact Statement, and

2) Rafferty/Alameda Project Specific Guidelines for the Preparation of an Environmental Impact Statement.

As stipulated in The Environmental Assessment Act, copies of the EIS, along with Saskatchewan Environment and Public Safety's technical review comments (see Appendix 1), were initially made available for public review from August 17 to September 16, 1987, at the following locations: Estevan, Weyburn, Regina and Saskatoon public libraries; University of Regina and University of Saskatchewan libraries; the Legislative Building and Saskatchewan Environment and Public Safety libraries in Regina; city offices in Weyburn and Estevan; town offices in Oxbow and Alameda; and R.M. offices in Mount Pleasant No. 2, Enniskillen No. 3, Coalfields No. 4, Estevan No. 5, Cambria No. 6, Souris Valley No. 7., Reciprocity No. 32, Moose Creek No. 33, Browning No. 34, Benson No. 35, Cymri No. 36 and Lomond No. 37.

The original thirty day review period was later extended by the Minister of Environment and Public Safety for an additional thirty days. During this sixty day period the public was invited to send written comments on the proposed project to the Department of Environment and Public Safety.

In 1986, during the period when the EIS was being prepared, the Minister of Environment and Public Safety deemed that an independent Board of Inquiry was warranted to review the proposed project.

THE TERMS OF REFERENCE

The Rafferty-Alameda Board of Inquiry was appointed by Ministerial Order under Section 14 of the Environmental Assessment Act on July 27, 1987. The terms of reference contained in the Minister's Order outline the scope of the Inquiry as follows:

THE BOARD SHALL:

(a) review information on the project including available environmental studies;
(b) facilitate the provision of information to the public;
(c) receive public comment on any matter related to the proposed development, including the social, economic and environmental implications;
(d) make recommendations based on its review of the project and the public comments as to the adequacy of the plans for mitigation of known or potential social, economic and environmental effects of the project;

(e) make recommendations to the Minister of Environment and Public Safety whether the project should proceed, should not proceed, or proceed subject to specified conditions;

IN CONDUCTING THE INQUIRY, THE BOARD:

(f) will organize and conduct informal public meetings in such places in Saskatchewan as the Board believes necessary to allow the public a reasonable opportunity to present their views on the project;
(g) will receive briefs, both written and oral, from individuals and organizations;
(h) will arrange for the proceedings of the meetings to be recorded and transcribed;
(i) will prepare a report of its findings and recommendations; and
(j) forward its report and a transcript of the proceedings of the public meetings to the Minister of Environment and Public Safety.

The Minister's Order and related schedules are attached in Appendix 2 of this Report.

PROCEDURES

The Board initially planned the following activities:

1. Tour the proposed project area.
2. Request a preliminary briefing on the technical aspects of the EIS by the SBDA.
3. Request the proponent of the project, the SBDA, to conduct public information sessions in Carlyle, Estevan, Oxbow, and Weyburn.
4. Schedule a series of informal public meetings in the same four locations and Regina.

5. Decide whether additional meetings would be necessary. This decision would be based on the content of the written submissions, verbal presentations, review comments by the Department of Environment and Public Saftey, and on the EIS. If the Board believed certain issues required further discussion additional meetings would be scheduled.

The first two activities were carried out in early August. On August 10th, the Board toured both the Rafferty and Alameda sites (as proposed at that time) by air and the Rafferty site by land. At a later date, the Board toured the Alameda site by land as well. On August 11, the Board received a one-day overview of the EIS (copies were submitted to the Board on August 7, 1987) by the SBDA. Both the tour and the briefing served to familiarize the Board with the nature and scope of the project.

The Board felt that the success of the public meetings from which it was to hear the views of the public would be enhanced if the SBDA were to conduct information meetings in some of the communities within the affected area. To this end, the SBDA was directed by the Board to hold information meetings in Carlyle, Oxbow, Weyburn and Estevan. The meetings were scheduled for August 17 and 18. The Board of Inquiry placed advertisements in the local newspapers advising the public of these meetings. The advertisement schedule is contained in Appendix 3.

The meetings, each approximately three hours long, provided information on the proposed projects with respect to their technical configurations, objectives and impacts. The SBDA was prepared to, and did, address questions. These meetings, however, were not intended to be used as forums for gathering public input but rather for the dissemination of information in preparation for the Board's public meetings. At least one Board member was present as an observer at each of the meetings; the Secretary to the Board attended all four meetings. The information meetings were well-attended (Appendix 4).

The Board then proceeded with a series of public meetings to receive public comment on the proposed projects. The rules used in operating these meetings were those of decorum, and courtesy and etiquette. All presenters were given a full opportunity to express their views and explain their concerns. Individuals or organizations wishing to make a presentation to the Board were asked to contact the Board Secretary to schedule a presentation at one of the meetings in the five communities identified. The Board members, did not seek to challenge any of the views of the person making the presentation but instead, asked questions of the presenters aimed at ensuring that the Board members understood the substance of the presentation. Following the Board's questions of the presenter, anyone in the audience was permitted to ask a question of the presenter to

clarify the meaning of the presenter's message. All questions were asked through the Chairman. The Chairman rejected any argumentative types of questions or statements at that stage. Following the scheduled presentations at each of the public meetings, anyone else in attendance who wished to make a presentation was heard. These meetings were held in Carlyle, Oxbow, Weyburn, Estevan and Regina between September 9 and 21, 1987. Advertising was placed in all local area weeklies as well as the four provincial daily newspapers (Appendix 5).

The public meetings generated a great deal of interest and participation among the residents of the Souris River and Moose Mountain Creek valleys as well as others from Saskatchewan, Manitoba and the neighboring State of North Dakota (Appendix 6). In total, the Board heard from 151 individuals and organizations during the eight days of meetings (Appendix 7).

Given that the proposed location of the Alameda dam was being re-examined by the SBDA during this period, the Board determined that a second public meeting should be held in the Oxbow-Alameda area when the location was finalized. At the November 13, 1987 (Appendix 8) meeting held in Alameda, nineteen additional briefs were presented (Appendix 9).

The Board reviewed the briefs submitted by the public, the review comments from Environment and Public Safety and the

EIS. To gain clarification on some outstanding issues the Board held meetings, which were open to the public, with the SBDA and its consultants on December 3 and 4 in Estevan. No further public meetings were held.

CRITICISMS

The Board of Inquiry was criticized early in the process for not providing the public with a longer period of time between the release of the EIS (August 16, 1987) and the commencement of the public meetings (September 9, 1987). The concern was threefold:

1) the length of the document precluded quick study;
2) the document was not widely available;
3) many of the people most affected by the proposed project were farmers and the release of the EIS and the dates of the meetings conflicted with harvest activities.

A few individuals and organizations requested an extension of the hearing dates for another sixty day period. These requests were made through letters to the Board as well as through verbal requests at the meetings. The request for a longer review period culminated in a legal proceeding being launched against the Board. The application was dismissed by the Court of Queen's Bench on September 11, 1987.

The Board was also criticized for the way it conducted the meetings. Specifically, the Board was criticized for not allowing questions from the audience to be addressed directly to the person presenting briefs. As well, several individuals felt the Board should have allowed questions to be directed to the representatives of the SBDA during the meetings and that the SBDA should have been given the opportunity to respond.

Finally, members of the environmental community were critical of the composition of the Board in that none of the members was considered to be a recognized environmentalist.

ACKNOWLEDGEMENTS

Conducting the inquiry and preparing the final report would have been very difficult had it not been for the assistance of a great many people.

Of these the most important were the women and men who appeared before the Board during our public meetings. Their views, along with those individuals who submitted written briefs, were invaluable in helping the Board arrive at its final recommendations.

We also wish to acknowledge with sincere thanks those who recorded the proceedings thus enabling us to concentrate on the presentations being made.

Our staff were invaluable to the completion of our review. Ms. Carmen Dybwad provided the vital administration control that allowed the meetings to go smoothly and she also demonstrated great skill in translating the deliberations of the Board into cogent text. Ms. Gale Bobbee, as the Board's only clerical resource, deserves special thanks for her efforts and patience in allowing the Board to complete its report. To both Ms. Dybwad and Ms. Bobbee and to all the other support personnel called upon to help, the Board is sincerely grateful.

CHAPTER 2: THE FRAMEWORK

INTRODUCTION

The Board received a vast amount of information from the EIS, the information meetings and from submitted presentations and briefs. It was evident that in order to categorize, analyze and evaluate this information a framework to facilitate analysis was required. Given that the proponent considers the Rafferty-Alameda development to be a multi-use water project, the proposal was studied within a generic framework of water management.

Historically, water management has occurred in response to the immediate needs for water by individuals, organizations and governments. The planning process was, at best, ad hoc. The emphasis of water management programs was limited to the construction of structures and facilities that would satisfy the identified needs. Little consideration was given to the overall long-term impact of the project on the environment and the residents of the area. For example, one need only look to the construction of the Gardiner Dam and the creation of

Lake Diefenbaker in the late 1950's . An environmental impact statement was not prepared, let alone studied and debated, for that project.

Increased public awareness of environmental issues, however, coupled with a greater willingness to exercise environmental rights, has affected how society views its water resources. Like air, water is no longer seen as a resource of constant good quality available to all in unlimited quantities. This recognition has resulted in active monitoring of water management developments and their effect on the environment. Governments, as custodians of our water resources, have responded to resulting public pressure by developing policies which both protect the environment and ensure efficient and effective use of our water resources.

In this chapter of the report, the development of water management and federal and provincial water management principles are examined. This review provided the Board with a base from which to develop a framework to evaluate the development proposal of the SBDA. It was not the intention of the Board to evaluate the water management approaches of any government or organization. We acknowledged and used them simply to aid in the development of an analytical framework.

THE CONCEPT OF WATER MANAGEMENT

Water resource management has become increasingly important in the past 20 years. The focus of attention has been in the development of appropriate policies relating to water allocation.

As such, the objective of water management is to provide sufficient quantities of good quality water required for economic growth and general welfare of the public. This fundamental goal is generally recognized by governing bodies, although the commitment to it may vary.[1] The Board was not concerned about various water management methodologies per se but rather the principles underlying the concept of water management.

The provision of an adequate water supply of dependable quality hinges upon supply and demand. Traditionally, water management has focussed on supply management, primarily because demand has been considered static and supply variable.[2] As demand for water supplies increased to meet growing domestic, agricultural and industrial needs, natural water systems were altered to ensure an available water supply. The critical factor requiring careful management was no longer one of supply, but of demand.

It follows then that water management should seek not only to secure an adequate supply of quality water but also to manage the demands placed on it. In other words, an overall policy and commitment to resource conservation is necessary.

The availability of water supply is limited. So must be the demand. In semi-arid regions, where augmenting an already scarce water supply is difficult, this balance is especially critical. The efficient use of water must be of paramount importance in these regions if effective water management is going to take place.

FEDERAL WATER POLICY

The federal government has played an important role in water resource management ever since the British North America Act of 1867. In these first years of nationhood the Department of Marine and Fisheries administered Canadian waters legislation.[3] The turn of the century witnessed a great increase in both the funds expended and the magnitude and scope of water projects undertaken by the federal government. Although the central government may have been slow in developing policies for flood control and relief (at least prior to 1950),[4] this was later rectified with the construction of flood protection for the cities of Vancouver,

Winnipeg and Toronto, and the St. Lawrence Seaway development.[5]

In 1970 five pieces of legislation regarding water were passed. These were: the Canada Water Act, the Arctic Waters Pollution Prevention Act, the Northern Inland Waters Act, and amendments to the Canadian Shipping Act and the Fisheries Act.[6]

Indeed, a new approach to water management was in place. In the words of R.L. Pentland, Director Water Planning and Management Branch, Environment Canada:

> . . . the federal emphasis prior to 1970 was on "mega projects" and water was viewed as a resource without social cost to be manipulated to man's advantage. Little attention was given to alternatives, aside from different structural alternatives. The impacts of consumptive uses, water quality issues and broader environmental issues were not well understood. The need for more comprehensive approaches, and the perceived need for increased federal-provincial cooperation in water management, led to passage of the Canada Water Act in 1970.[7]

The results of this increased co-operation between federal and provincial governments can be seen in the basin planning studies developed during the 1970's. The Souris River Basin Study of 1978, for example, was undertaken by the governments of Canada, Manitoba and Saskatchewan.

During the ensuing years the issues surrounding water management multiplied, as did the number of water projects and

the number of federal agencies with an interest in water management. It was rapidly becoming obvious that a co-ordinated federal policy regarding water issues was necessary.

In response, the Federal Government established an Inquiry on Federal Water Policy in January 1984. The three member commission was comprised of Peter H. Pearse (Chairman), Francoise Bertrand and James W. MacLaren. The commission was directed to seek the views of governments, government bodies, and the public - individuals and groups concerned about water resources.

The final report of the Inquiry, submitted in September 1985, was a comprehensive document which summarized the history of water management from a federal perspective. The report looked at the delicate balance between supply and demand, the ever important concern over water quality and the legal implications of the new constitution regarding our federal water policy and programs. The report also addressed the issue of administration. This was of interest to the Board since confusion over the authority for water management seems to be a problem endemic to governments.

The report contained recommendations on a number of issues relating to Canada's water policy. In preparing these

recommendations, the committee followed eight principles of water management. These principles are:

1. The watershed is the natural and most appropriate unit of water management.
2. Water management should accommodate the interdependence of multiple water and land uses within the watershed.
3. Water management must recognize the continuity of the hydrologic cycle. Surface water, ground water and the atmosphere must be considered as an integrated system.
4. Water policy and management should aim at sustaining the natural health and productivity of water systems.
5. Proposals for water development projects should take systematic account of economic and environmental risks and uncertainties.
6. When major or irreversible alterations to water systems are contemplated, the intrinsic value of preserving natural flows and the hydrologic regime should be recognized.
7. Because water is a valuable natural resource, users should be encouraged to recognize the value of the water they use and the associated costs of providing it.
8. To ensure that the full spectrum of public values is considered in water management decisions, effective public participation must be sought.[8]

Guided by the report of the Inquiry on Federal Water Policy, Environment Canada prepared the Federal Water Policy, released on November 5, 1987. The Federal Water Policy is comprised of a series of goals, strategies and policies designed to protect Canada's precious water resources. The Federal Government did not intend this to be a definitive water policy, cast in stone, but rather one which would evolve as conditions change.

PROVINCIAL WATER POLICY

During the early years of settlement in the Province of Saskatchewan, water management was guided more by meteorologic vagaries than by planning strategies. In years of drought the residents of the province were busy building dams, dug-outs and cisterns in an attempt to save as much precious water as possible. In wet periods the concern was with drainage. The cycle continued until the drought of the 1930's when the water shortage became so critical government assistance was required to deal with the problem.

The Natural Resource Transfer Agreement of 1930 gave the provinces the right to manage the natural resources within provincial boundaries. This, however, did not immediately

preclude federal assistance with water issues. The federal Prairie Farm Rehabilitation Administration (PFRA) was established in 1935 to deal with water problems, among other areas of responsibility. Because the PFRA, a federal agency, played a significant role in water management, provincial initiative in this area was not as strong as it may otherwise have been.[9]

Until 1964, provincial water resources were managed primarily by the Department of Agriculture, the Department of Public Health and the SPC. In 1964 the Saskatchewan Water Resources Commission was created to govern provincial water resource development. The Commission took over the administration of The Ground Water Conservation Act and The Water Power Act, formerly administered by the Department of Agriculture and SPC respectively.[10] In 1972 the powers of The Saskatchewan Water Resources Commission Act were transferred to The Water Resources Management Act which along with The Ground Water Conservation Act, The Water Rights Act and The Water Power Act were to be administered by the newly created Department of the Environment.[11]

In 1976, the Department of Environment proposed that a study of water management issues in the province be undertaken. In 1980, a seven volume report titled "Water Management in Saskatchewan" was released by the Hydrology Branch of Saskatchewan Environment. This comprehensive report includes information about the history of water management in

the province. As well, it provides sixty-three recommendations for dealing with provincial water management problems.[12]

The report highlights four important principles which "may be considered to be guidelines or ideals which will ensure efficient and wise management of our water resources".[13] These principles are:

1. The basic requirements in water management are conservation, long range planning, co-ordination of planning and development, regulation of supply and control of pollution.
2. The management of water resources should be based on natural basins rather than on political or administrative boundaries.
3. The best use goals of water management can be achieved through a combination of scientific research, a co-ordinated development program and strengthened government policies.
4. The purpose of water management is to service the needs and respond to the wishes of the people whenever possible.[14]

The incorporation of the Saskatchewan Water Corporation (SWC) in 1984 represented another step in co-ordinating water resource management policy development and administration. The Water Corporation was given considerable authority over the management, administration, development, control and protection of the province's water and related land resources.[15]

THE BOARD'S ANALYTICAL FRAMEWORK

Accepting that the goal of water management is to provide sufficient quantities of good quality water required for economic growth and general welfare of the public, the Board then determined what criteria must be met to achieve this goal.

It is evident to the Board that if principles of water management are used to guide water resource policy in the province, then similar principles should be applied to specific projects. In other words, if a project adheres to the basic principles of water management, then it should ultimately meet the goal of water management on a broader scale. If a project fails to address these principles, its viability would be questionable. Since the Rafferty-Alameda project states its ultimate aim is improved water management for the Souris River Basin, it is logical that the proposal be analyzed within the broad scope of water management principles.

One principle in water management recognizes the intricate and often delicate balance of resource interdependence within the bounds of a drainage basin in a given jurisdiction. In using the watershed as a natural planning unit the impact of changes in land use, surface and underground water regimes and their unique characteristics can be duly considered and fully taken into account. Based on this, the first guideline the Board adopted is:

1. The management of water resources should be based on natural drainage basins within the jurisdiction of the proponent.

The importance of balancing supply and demand cannot be overlooked. In implementing any water management plan or program for an area, consideration must be given to the supply of water and the potential demands that will be placed on it in order to ensure efficient, effective and economic use of water resources. Because single use water programs are too costly, in terms of lost opportunities, the interdependence of all water and land uses must be recognized and considered. The second guideline is:

2. The management of water resources should recognize the interdependence of all potential water and land uses and balance these with water supply.

Mankind's progress is indeed remarkable. But that progress has had an effect, often negative, on our natural environment. The extirpation of many species of wildlife and the threat of extinction to many more, the harm done to the earth's atmosphere, the life threatening presence of toxic chemicals in our own back yards have given rise to great concern for the environment and indeed our survival. Water management proposals must fully consider the interrelationships between ground and surface waters, aquifers and surrounding land and

ensure that their natural productivity and health are maintained. If permanent changes are being proposed, all environmental risks must be considered and proposals for amelioration against negative impacts outlined. Hence, the third guideline:

3. **Water management must recognize the interrelationships that exist within water systems and fully consider the impact that any alteration will have on the health and viability of these systems.**

If a resource is to truly serve the needs of people, public participation in the decision-making process is vital. It is also important that those affected by development initiatives have an opportunity to voice their concerns and have an impact on actions taken. Finally, the fourth principle:

4. **Water management must consider the needs and wishes of the public and ensure that the public have input into development plans.**

The Board determined that if these four principles are met the long run goal of good water management can be attained and if any are not met the goal cannot be attained.

CHAPTER 3: THE FRAMEWORK APPLIED

THE PROPOSAL

The Board then determined whether or not the elements of the proposed Rafferty-Alameda project presented in the EIS met the criteria for water management established by the Board. This task was simply to ensure that the SBDA had addressed each of the elements of the Board's analytical framework.

1. **The first principle adopted by the Board is that water management should be based on natural drainage basins.**

Historically the Souris Basin has been viewed in its entirety; the Souris River Basin Study of 1978 and the various International Joint Commission[16] hearings held in the 1940's and 1950's bear witness to this. In these instances, the studies were joint undertakings between two or more of the jurisdictions having portions of the Souris Basin within their boundaries. Figure 1 shows the interjurisdictional boundaries of the Souris River Basin.

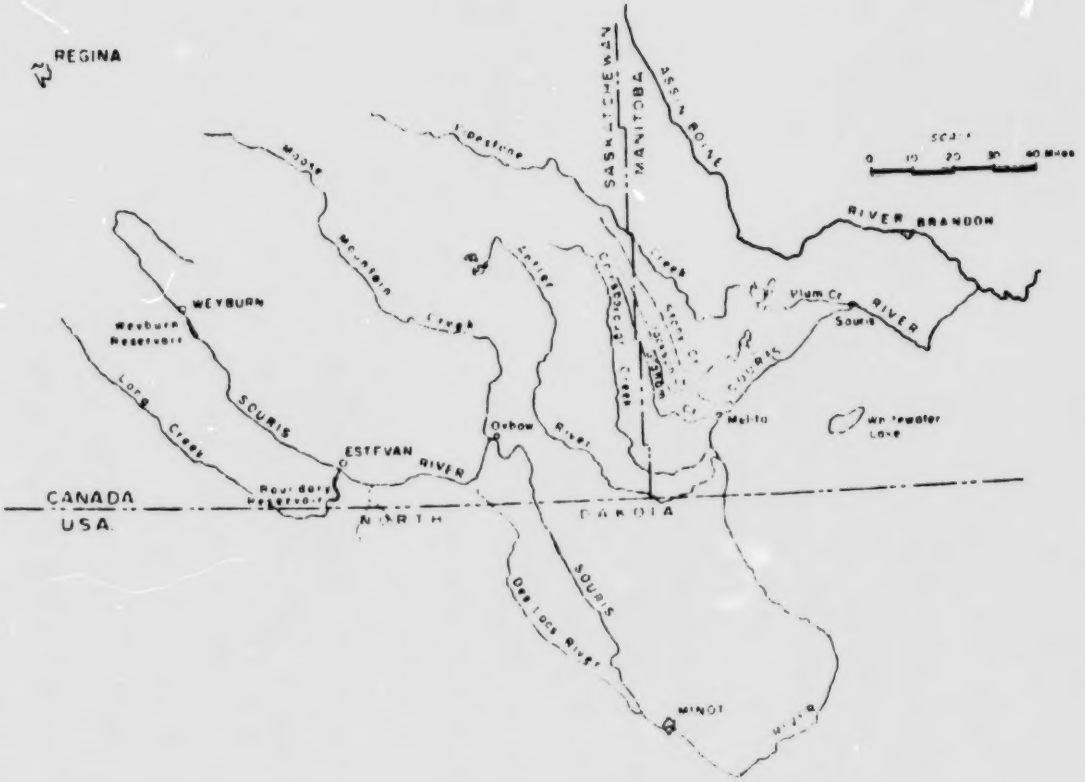

FIGURE 1

Source: Souris River Basin Study Board, Souris River Basin Study Report, June 1978, p. 3.

The EIS filed by the SBDA cannot, by the proponent's own admission and by the Project Specific Guidelines issued by Saskatchewan Environment and Public Safety, deal with impacts outside of the provincial boundaries. This is mitigated to some extent by the involvement of the U.S. Army Corps of Engineers, and consultations between the SBDA and the Manitoba Department of Natural Resources.

Considering the portion of the Basin encompassed by Saskatchewan's boundaries, the EIS is based on a natural drainage basin and does not introduce any water management plans that would have an impact on other basins. The Board is assured that the potential for integrated watershed planning of the Basin's land and water resources does exist and that these plans are based on basin boundaries as described in the EIS.

2. **The second principle the Board recognizes is that the interdependence of all potential land and water uses must be acknowledged and considered in the overall water management plan.**

The EIS acknowledges the potential of various uses of the proposed reservoirs and surrounding lands. The benefits for recreation, industry, agriculture, wildlife and apportionment obligations are recognized and discussed.

Recognition alone, however, does not imply that the interdependence of these multiple uses has been fully considered. In view of this, the Board sought proof that the SBDA had dealt with the competition for water supply. The hydrology model presented in Chapter 7 of the EIS indicates that this element has been given extensive consideration. The use of different scenarios based on changing demand and supply parameters demonstrates a recognition of the need to balance water demand and supply.

3. The third principle of the Board states that when significant alterations to the existing nature of a river basin are proposed, environmental risks and uncertainties must be determined.

When the changes are irreversible it is even more critical that the impact on the entire water system be considered.

To adequately study the interdependencies of all the elements of a water system an analysis of the hydrologic cycle, surface water, aquifer formations and surrounding soil and mineral composition is required.

In the introduction to the Soils section of the EIS (Chapter 9) the proponent makes the following statement:

> The primary reason for soil characterization and monitoring is the direct/indirect relationships that exist between soil quality, crop land productivity, surface and groundwater quality, and human and animal health.

This statement, taken in conjunction with the analysis of the hydrology (Chapter 7), hydrogeology (Chapter 6), and water quality (Chapter 8) of the Souris River Basin indicates to the Board that the proponent is at least considering the existing health of the water system and the impact of the proposed changes. In addition, the proponent acknowledges the importance of the human and animal inhabitants of the region (Chapters 2, 14 and 15) and how they will be affected by the project.

4. The fourth principle states that the goal of good water management is to serve the needs of the residents of a basin.

It is imperative that area residents have an opportunity to participate in the decision-making process from the initial planning stages through to project completion.

An entire section of the EIS is devoted to a summary of public involvement in studies designed to develop the water resources of the Souris River System. The Board is assured that this element of water management has been addressed.

CONCLUSION

In conclusion, it is the Board's opinion that the principles of water management, as defined by the Board, are acknowledged and at a minimum considered by the SBDA in the EIS. In stating this, the Board emphasizes that at this stage of the analysis it has not made a value judgement with respect to the quality or adequacy with which the SBDA addresses the specific environmental impacts of this project and appropriate mitigation thereof. In this chapter of the report the Board sought only to ascertain whether or not the basic principles of a sound water management project have been addressed in the proposal and that it is reasonable to proceed to a more in depth review.

CHAPTER 4: PUBLIC INVOLVEMENT

RECEIVING PUBLIC COMMENT

One of the responsibilities of the Board was to invite and receive public comment on the proposed project. This was done through public meetings and written briefs. In total, between September 9 and November 13, 1987, the Board held fifty-two hours of meetings in six areas; Carlyle, Oxbow, Weyburn, Estevan, Regina and Alameda. In addition to the briefs submitted at the public meetings, the Board received 25 written briefs (Appendix 10).

The Board received comment from people and organizations from different backgrounds, with different concerns and divergent opinions. Some of these people have lived their entire lives in the Souris River Basin, others do business there now. Provincial, national and international organizations brought the views of environmentalists to the forum. Professionals, academics, and representatives of business presented their concerns. The spectrum was all encompassing. Some presentations spoke of general issues surrounding developments like the proposed Rafferty-Alameda project. Others spoke of specific aspects of this project and

of the EIS. Some came before the Board or submitted briefs that were technical and laden with impressive statistics to support their views. Others spoke from the heart and imparted to the Board a love of the area and a personal commitment to it. The personal knowledge and experience of life along the Souris River and Moose Mountain Creek provided a very important perspective for the Board. For it is the people who live in the Basin, perhaps more than any others, who will be affected by any development plans for the area.

LEARNING ABOUT THE SOURIS RIVER BASIN

The public comments received by the Board ranged from concerns about water quality to quality of life. In order to fully comprehend these, the Board had to come to appreciate the Souris River Basin. Tours by land and air, which the Board did undertake, only imparted a portion of understanding; the rest was supplied by experts - the area residents. From them the Board learned that the Souris River and Moose Mountain Creek are areas of great beauty, havens for wildlife and the source of many personal memories, both good and bad. These memories were enhanced with film, slides, pictures and poetry, laughter and tears; all helped the Board see the valleys as the presenters did, to see the area through their eyes.

Personal experience and memories were not all that was brought before the Board. The presenters also showed a keen understanding of the issues surrounding a project of this nature. The comments demonstrated recognition of the multiple-use objectives of the proposed development and the competitive nature of the demands these uses would place on the water supply.

This chapter attempts to summarize the public comment by presenting quotes which are representative of common views made known to the Board. In many respects, this is a disservice to the people who made representation to the Board. Every comment was listened to and read carefully and had its impact on the Board, but relatively few have been explicitly cited. The Board also acknowledges that the expression and emotion felt at the meetings cannot be replicated in print. Within these constraints the Board presents its summary of views and concerns expressed by the public.

Variable Water Supply

> Mr. Chairman, people have talked about this river, they have met formally about this river and governments have commissioned studies on this river. The Saskatchewan Government, the North Dakota Government, the Manitoba Government and both the U.S. and Canadian Federal Governments have examined this river. This river formed part of the Nelson Study, and itself was a subject of the Souris Basin Study. This study, which lasted four and a half years,

> examined all the other studies that had been done as well as accumulating new data and information based on all the facts available. The Souris Basin Study involved people along the river, and included their ideas, concerns and information. I have been told that the late Percy Brockenton, from Melita, Manitoba, brought his and his father's diaries to the meetings held in that community, which included information dated back over one hundred years. Those diaries told of flood and drought which not only helped the study, but were able to show the commission the extent to which residents in the river basin were aware of the river and its impact on their daily lives.
>
> - John Empey, Estevan Chamber of Commerce (Regina transcripts, pp. 30-31)

As evinced in the above quote, the Souris River System has been the subject of many studies, commissions and task forces. One of the primary focuses of these initiatives has been the alternating abundance and scarcity of water and the problems that each condition brings to the people of the area. It seems that for as long as people have settled in the area, the management of the unpredictable water supply of the Souris has been a fundamental concern.

That the valley suffers from the vicissitudes of the river's flow does not appear to be a point of contention. Indeed, if anything is readily agreed to, it is that the valley has witnessed many floods over the course of recorded history. The affect of these periodic floods, however, are viewed differently. To some the floods bring devastation and loss.

> The mobile home owners at River Park Pavillion, adjacent to this business, (Estevan Greenhouse and Nursery) scrambled to move their homes to higher ground as water lapped at their door steps, some left

their homes only to return after the flood had receded, to find their homes waterlogged with ruined furniture, silt, et cetera.

- Ken Czoba
(Estevan transcripts, p. 131)

We don't have any water. We have floods. I've sandbagged them, and that's not fun. You see people lose homes, people lose members of their family in the floods - it's not right.

- Brad Dutton
(Regina transcripts, p. 192)

To others the floods bring rejuvenation and enrichment.

Problems of water scarcity and period flooding are used to justify these dams. As to the latter - flooding - please realize that floods are a natural and, indeed, important event on flood plains. In fact, they are what make flood plains in semi-arid environments fertile, productive and biologically diverse.

- Bert Weichel
Saskatchewan Environmental Society
(Regina transcripts, p. 65)

The negative effects of flooding on the Souris are not confined to the borders of Saskatchewan either. Downstream residents from North Dakota and Manitoba told of their experiences living along the River's banks.

For example, the Mayor of Minot, North Dakota, George Christenson, spoke of the devastation that took place in Minot during the 1969 flood.

Lately we've experienced somewhat normal river flow conditions, but as you know, the late 60's and early 70's produced devastating floods from the Souris. The 1969 flood affected 13,000 people in

> Minot, flooded 3,000 homes, many churches, almost half of the schools in our city and many businesses. A gigantic lake bisecting the city was present for forty days and forty nights. Property loss and personal hardship from that flood are almost beyond comprehension, when you consider the placid stream that the Souris is, most of the time.
>
> - George Christensen, City of Minot
> (Estevan transcripts, p. 146)

Mayor Ken Carels of Melita, Manitoba, told much the same story about the devastation that takes place in the town of Melita, or in his words, ". . . any city, town or village along the river." (Mayor Ken Carels, Town of Melita, Manitoba, Carlyle transcripts, p. 23).

The abundance of water in the spring sharply contrasts the condition of the valley during the rest of the year when water is a scarce commodity. Drought, like floods, also cause hardship for residents of the Souris River Valley. In the words of Dale Malmgren:

> The history of the Souris Basin area indicates extremes in water quantities -- too much water some years and far too little in others. In years of drought, cities, towns and villages along the Souris River are compelled to restrict water usage. The Hamlet of Hitchcock obtains their water requirements from a well located some 5 miles from the hamlet. In times of low rainfall the water source is unable to supply the demands of the hamlet residents. A recurring problem of the City of Estevan appears to be the supply of adequate and quality water for their residents.
>
> - Dale Malmgren, R.M. of Estevan
> (Estevan transcripts, pp. 8-9)

Again, there is no debate. The concerns of the residents focus not on the cyclical nature of the availability of water but on how to manage it most effectively: how to control the erratic flow in order to hold some of the spring run-off for use during drier months. Comments by Jack Muirhead echo this sentiment:

> This spring we had between 15,000 and 20,000 acre feet of water go through Estevan - we didn't save a drop. A friend of mine lives on the land in the valley; in June he tried to irrigate 30 acres, he managed 30 acres and pumped the river dry. Now, this to me is a bloody sin - to let 15 to 20 thousand acre feet of water go by your door and not save a drop; when you need it, it isn't there.
>
> - Jack Muirhead
> (Oxbow transcripts, p. 40)

This problem, according to Al Watson from Yellow Grass, occurs not only on the Souris River but on all the creeks in the entire basin.

> We live about three-quarters of a mile adjacent to the Yellow Grass Ditch. Between our house and barns when we were small, there was a mighty river flowing every spring; well, almost every spring. It was a very, very unpredictable thing, this Souris. . . .
>
> What I'm trying to say is that what was happening at our place wasn't just happening there. It was happening all over the Souris Basin at the same time, and consequently, for 11 1/2 months of the year, we'd like to have a little water. Then, all of a sudden, we got a full year's supply and it was running for two weeks and then gone. That happens all over the Souris Basin, not only on the Souris here. It happens on the main Souris here . . . it happens in Long Creek; it happens in the Moose Mountain Creek; it happens to the northwest of us in the Wascana area; and the Moose Jaw River areas. But, in the Souris area, we just haven't

got the capacity to handle that water when it comes. There's just no way that it can be done under the present system.

- Al Watson
(Weyburn transcripts, pp. 186-187)

Economic Environment

The majority of the comments received by the Board fall into easily defined categories such as wildlife, land use, recreation and so on. However, some comments are more difficult to categorize. These comments are about commitment to the Souris Basin, about potential, about the future.

> It is very simple to say that you're damming it only for the purpose of flood control. That is a good enough reason in itself and maybe a few have to lose in order that many more can gain. . . . It is very important that people realize that some people have to lose in order for there to be a big winner and the big winner is everybody in this area. We have waited for this dam since before my time, if we don't get it now and if we don't get Shand and don't get a lot of other things we won't see very much of anything.
>
> - Tony Sereggela
> (Oxbow transcripts, p. 55)

> Resources guarantee jobs, but why isn't it, with all these guaranteed jobs that Estevan isn't the third largest city in Saskatchewan. I've often wondered that. Why does primary industry make up such a large percentage of this area's labour force. Well there are reasons. Seriously, we don't have the recreation or the scenery that attracts people to this area. We need those people, we need those people to develop a well rounded community with a strong service sector and an economy based on resources alone is an unstable economy. It tends to be a boom and bust type of economy and that is not the type of community that really bolsters community pride.

What I want for Estevan is more than just a person who is here for a buck. I want people to settle here and be proud that they live in one of the most attractive areas in the Province with things to do. I want families to settle here, I want people to retire here, and for me that's what this Rafferty-Alameda Project is about.

- Cameron Muir
(Estevan transcripts, p. 144)

The Souris Valley is a beautiful place. Our small area would not be covered with water without our family feeling pains of sorrow. Yet, as a farmer at the heart of the reservoir, we must look forward to providing work for our young people; to provide for population growth in our communities; to provide flood control and to provide recreation.

- Paul Bachorcik
(Estevan transcripts, p. 85)

CONFLICTING DEMANDS

In many respects, the choice of how best to manage an area's water resources is dependent upon what people want to achieve with those resources. Before the most efficient, effective and economical method for water management can be determined, the demands and needs of the area under consideration must be defined. In other words, what do the people of the area want their water resources to do for them?

Irrigation

The Board heard and received many submissions which reflected anticipation of the potential benefits increased irrigation would bring to the Souris and Moose Mountain Valleys. It is felt that the positive spinoffs generated by a more diverse and stable agricultural base will provide a greater degree of economic stability for the region's agricultural sector. Emile Lalonde, an Estevan area dairy farmer, told the Board that irrigation would not only increase the quantity and quality of his hay crop, but also reduce his occasional need to purchase hay from outside the province (Emile Lalonde, Estevan transcripts, pp. 211-212). In addition to reducing the area's dependence on outside agricultural products, it is believed irrigation would help diversify the present agricultural base.

> This southeast region of our province is in constant need of moisture and, as a result, we have not been able to diversify our agricultural production. This 30 mile body of water will provide that opportunity.
>
> We realize that irrigation farming is a long-term objective and to diversify into intensified agricultural production requires attitude changes as well as processing and marketing opportunities.
>
> We are advised that a large area of farmland in the Weyburn area is suitable for irrigation, and knowing that the province is committed to further agricultural processing, we feel that we have a good opportunity to pursue food processing plants.

> We also view Weyburn as the ideal location for an irrigation equipment distribution and service centre.
>
> - Mayor William Shields, City of Weyburn, (Weyburn transcripts, pp. 7-8)

Others are less optimistic about the possible benefits of irrigation. Glen Swallow of Alameda, among others, questions the economics of irrigation and suggests that the costs of such an endeavour often outweigh the return.

> If anyone doubts the prohibitive costs of getting into upland irrigation, you can verify these statements by simply contacting the bankrupt farmers at the Diefenbaker - Outlook irrigation project. There are many farmers there who owned their own farms and had money in the bank when they decided to go into irrigation. Most of them are bankrupt now.
>
> - Glen Swallow (Oxbow transcripts p. 114)

Joe Harvey of Alameda and Mervin Freeman doubt that the land itself would be receptive to irrigation because of its salt content. In Mr. Freeman's words, "If irrigation was possible, it would still not be feasible in this area due to intensive labour demands and high salinity potential of the land" (Mervin Freeman, Weyburn transcripts, p. 123). And finally, Gordon Geske, a farmer from the Macoun area, states that since the availability of water for irrigation is not guaranteed 100 percent of the time any capital investment in irrigation would be risky.

As someone who has been involved in irrigated hay for 20 years, I know that having water 70 percent of the time is not good enough because that would mean that at the point when one needs the water the most they will not have it. With the cost of irrigation equipment and land preparation this would prove disastrous.

- Gordon Geske
(Estevan transcripts, p. 276)

Recreation

Recreation development within the Basin met with differing opinions about the interpretation of "recreation". Some, like Mayor Shields of Weyburn, welcome the increased development of cottage areas (Mayor William Shields, City of Weyburn, Weyburn transcripts, pp. 8-9).

Others see recreation opportunities to include water sports, camping and picnicing (William D. Goodmanson, Estevan Lions Club, Estevan transcripts, p. 119). Indeed, some area residents are truly excited about the recreation potential of a reservoir in their area after seeing the benefits similar projects have brought to other areas.

You know, we were on our way to Saskatoon, going through the Blackstrap Valley, No. 11 Highway . . . goes right through it, and you look to the right and you see Blackstrap Lake that has been created by a channel diverting water from Lake Diefenbaker. A little different than this, in that the water level can be maintained and sure, that's quite a big difference because here you can't. You can't maintain it like they can there.

> But all of a sudden there's a valley, a valley very similar to this valley here, that's got a hubbub of activity in it. You got cottages. It's nothing to sit there and watch sailboats, watch waterskiers, watch anything you want to.
>
> - Al Watson
> (Weyburn transcripts, p. 194)

But a single definition of recreation is not universally shared. Lila McNeil's comments illustrate this:

> . . . we have been sold on the fact that recreation in our society is things that are fast moving - boats, and waterskiing and swimming . . . or out on a hockey arena . . . or football field. That's the only kind of recreation that is recreation. Now, I've been a C.G.I.T. and a Youth Group Leader for a number of years in the past and some of the most beautiful land in this country lies along Moose Creek. There's some beautiful backwoods camping in there and I've done a lot of it. . . . something that has really surprised me is that I have taken a group of kids down there over the years, every year, and one of the things that is a shock to them to know is that they live, some of them, two and three miles from some of the most beautiful country that they could see.
>
> - Lila McNeil
> (Carlyle transcripts, p. 108)

It is recognized that there would be a significant time lag between the commencement of the project and the availability of developed recreation facilities (written brief submitted by the Dr. Mainprize Regional Park Authority). As well, the ability of the reservoirs to support recreation given that the quality and quantity of water would be suboptimal is a concern (Don Wilkinson, Weyburn transcripts, pp. 142-143). In addition, there is uncertainty about the recreational attractiveness of the proposed reservoirs in light of fluctuating water levels.

> Intentions to stock the reservoir with fish, and with boating, et cetera, perhaps over time this "mini-resort" could attract the rambling tourist. I agree with them if it can be done economically and responsibly. Keeping in mind the water fluctuates as much as 10.2 metres, with natural vegetation drowned and root structures dead and decaying away . . . terracing from water waves and slumping of this fragile and textured earth will leave mud flats along the shorelines each time the water level is reduced.
>
> - Ed Tetzlaff
> (Alameda transcripts, p. 132)

Many critics of the proposed Rafferty-Alameda project believe the potential benefits from the project for recreational development are overstated (written brief submitted by the National Wildlife Federation). As well, there is concern that in proceeding with the development of these recreation sites, other more important parks proposed for development at Cumberland Delta, Athabasca Sand Dunes and the Great Sand Hills would be removed from consideration due to budget constraints (written brief submitted by the Saskatchewan Natural History Society).

Apportionment to the United States

The obligation of Saskatchewan to send fifty percent of the annual flow volume on to North Dakota is also viewed as a demand which would have an impact on the water management of the Basin. To some, that Saskatchewan is required to send only fifty percent, and not the percentage it presently sends, is reason enough to warrant better control over the area's water.

To others, like the Citizens Concerned About Free Trade, any water project entered into with the United States represents a potential loss of Canadian Sovereignty over its water resources (David Orchard, Citizens Concerned About Free Trade, Regina transcripts, pp. 122-137). Strong concern is evident about the ultimate control the United States may have over waters of the Souris River and Moose Mountain Creek and whether other demands for the water would be subjected to meeting our appropriation requirement. This is seen to be particularly critical should the region experience prolonged periods of drought where reservoir stores would have trouble maintaining an adequate water level.

Orlin Hanson, a member of the North Dakota State Legislative Assembly, sought to allay such fears by saying:

> I want to stress here that the United States is not building dams in Canada, but we will pay for flood storage behind those dams, when and if they are built by your Canadians for other purposes such as cooling water for the Shand electrical generating plant.
>
> - Orlin Hanson
> City/Rural Flood Control Group
> (Regina transcripts, p. 157)

Residents of the Alameda area add a different dimension to the apportionment issue. They feel the only reason for building the Alameda dam is to meet this obligation to the United States.

> The water in the Rafferty Dam will cover a large acreage and be relatively shallow with a very high evaporation factor. Also, they are proposing to build a diversion channel to the Boundary Dam, which is always short of water, and they want to cool the proposed new Shand Power Plant with this water. For these reasons it is a well known fact that they will not be using the Rafferty Dam water to supply the commitment to the Americans. This is the main reason for building the Alameda Dam.
>
> - Don McLean
> (Alameda transcripts, pp. 155-156)

It is the opinion of these people that if the requirement to provide flood protection for Minot is removed from the project, the need for the Alameda dam would also be removed.

Industrial Use

Although the Board's terms of reference do not include the Shand generating station per se, the fact that the proposed Rafferty reservoir would provide water for plant cooling drew public comment at the meetings, and focusses attention on that project as well. Discussion about Shand ranges from the very specific (should it be air cooled or water cooled?) to the very general (do we need to build another generating station at all?).

For example, some people feel that air-cooling the generators is a better option, economically and environmentally, than water-cooling (Bert Weichel, Saskatchewan Environmental Society, Regina transcripts, pp. 63-71). United

Mine Workers' spokesman, Roy Ludwig, expresses the opposite viewpoint when he states that, "we believe the Rafferty would create a more efficient way of cooling than building an air-cooled plant at Shand." (Roy Ludwig, United Mine Workers of America, Local 7606, Estevan transcripts, p. 313). However, such a discussion assumes the building of Shand, a supposition that in itself draws debate. Some express the view that the construction of Shand and the provision of a secure water supply in the Estevan area is the best way to ensure a continued supply of power to the province (Brad Dutton, Regina transcripts p. 190). Others believe purchasing power from Manitoba, conserving power in Saskatchewan or employing new transmission technology are all viable alternatives to increasing power generating capacity in the province. Glenn Swallow's comments at the Alameda meeting expand on this:

> According to S.P.C.'s 1986 Annual Report, we imported 66,208,000 kw hours of electricity into this province. The retail price in Saskatchewan is 5.1 cents per kw hour. .Applying that cost suggests that in dollars and cents Saskatchewan paid about $3,376,000 for imported electricity. It also says in this report that this imported amount of electricity decreased by 77 percent from the previous year. So the cost of imported electricity is about 1/5 of the cost of the interest on the money borrowed to build the Shand and Alameda Dam, assuming that the money has to be borrowed. For that reason, it doesn't make economic sense to me.
>
> The people of Saskatchewan will pay for this project in the form of increased power rates for years to come. Really, all that needs to happen is that each person in Saskatchewan needs to consume $4 less electricity and we would not have had to import any electricity at all in 1986. I would suggest that $4 is a small sacrifice compared to what land owners have

> been asked to sacrifice. Also, 1,259,879,000 kw hours of electricity were lost or unaccounted for. That's about 10 percent of the power generated that was lost or unaccounted for. Now, I am assuming that the major portion was lost in transmission. At the moment there is new technology being developed that shows we will soon be able to transmit electricity with no loss whatsoever. In fact, I believe now it can be done at lower temperatures, possibly winter time temperatures, and it is likely technology will be available before the power from Shand becomes available. When it comes available, at the current rates, we would have about 1,000,000 kw hours of electricity produced in this province.
>
> - Glen Swallow
> (Alameda transcripts, pp. 119-120)

Considering the competitive nature of these demands, area residents recognize the development can not furnish unlimited water resources for all end users. Clearly, choices must be made about the best use of those resources.

ENVIRONMENT

Presentations made to the Board focus not only on the potential demands which will be placed on the water resources of the Rafferty and Alameda dams; they also recognize the impact such developments will have on the environment of the Souris Basin.

Wildlife

One of the concerns raised most often deals with the impact of the proposed development on wildlife in the area. Many representatives of the environmental organizations and others fear that numerous species will be unable to adapt to changes in their environment, leading to a reduction or complete loss of some populations. In the words of the Weyburn Branch of the Saskatchewan Wildlife Federation, "Once you destroy the habitat, it is gone forever and the wildlife within is decimated." (Lorne Onstad, Weyburn Branch - Saskatchewan Wildlife Federation, Weyburn transcripts p. 63). Judy Swallow of Alameda voiced a similar opinion at the Carlyle meetings when she spoke of potential problems with wildlife and fisheries:

> To me, when it is causing a death of something, I think it's time we have a really, really, strong look at whether it's feasible. There is loss of spawning, loss of eggs, loss of habitat. The whole system is being disrupted and in many cases lost, and you can't replace habitat that has been there for thousands of years. There have been changes, but they've been natural changes in most cases. Habitat can't be reproduced.
>
> - Judy Swallow
> (Carlyle transcripts, p. 116)

On the other hand, some area farmers are concerned that the reservoirs would provide an all too inviting habitat for waterfowl and thus subject their crops to increased depredation.

> This impact may very well result in an increased number of waterfowl among other effects. Such an increase in numbers will undoubtedly result in grain losses due to birds feeding from adjacent grain fields. I am currently experiencing such uncompensated losses occasioned by wild ducks . . .
>
> - Herb Lapp
> (Written brief submitted to Board))

The Saskatchewan Wildlife Federation, represented by Ed Begin, raise yet another concern; the potential for increased deer/vehicle collisions due to changed migration patterns.

> Most of the mortality occurs in the spring and fall as deer move from winter to summer ranges and back. The highways in the region are already bad, and with the Souris habitat being lost, we expect deer accidents to increase dramatically. Thus, you not only lose deer, but increase the risk to human life and associated costs of vehicle repairs.
>
> - Ed Begin, Saskatchewan Wildlife Federation
> (Regina transcripts, pp. 80-81)

In addition to the direct impact of the project on wildlife habitat, concern for the indirect impact is also expressed. Specifically, many individuals and organizations feel the building of dams on the Souris River and Moose Mountain Creek will result in increased wetland drainage and have a severe impact on waterfowl in the area.

> The Impact Statement mentions that the proposed dams will eliminate flooding in the valley up to the 1 in 100 flood event. If the flooding problem is solved, it will be difficult to deny future drainage requests on the same basis that they are turned down now.

> Ducks Unlimited has identified over 40,000 acres of wetlands that can still be drained in the Souris basin. We must ensure now that these areas remain protected.
>
> - Tim Thiele, Ducks Unlimited
> (Regina transcripts, p. 60)

Yet others feel that the proposed developments will enhance the present wildlife habitat in the Souris Valley. Gerry Fichtemann indicates the decreased flow of the Souris in recent years has reduced the quality of the water so that the once plentiful turtle population has become all but nonexistant (Gerry Fichtemann, Weyburn transcripts pp. 101-102). In addition to this comment regarding the present turtle population along the river, the Board was presented with a graphic indication of the turtle population's ability to thrive in a reservoir environment. While the Board is unable to provide the picture, it can relay the verbal description which accompanied it.

> In the Environmental Study there was a picture of a turtle and it was suggested it might be going into extinction. I have a picture of a turtle that was caught at Boundary Lake this summer by one of my employees. The turtle weighs 50 pounds, it is 31 1/2 inches long and 18 inches wide. I say, therefore, by the building of these two dams, we will enchance the habitat for these turtles.
>
> - Vernon McLean
> (Regina transcripts, p. 38)

Nor are all presenters pleased with the need to acquire productive farm land for wildlife habitat replacement, claiming that the animals and birds would adapt on their own.

> The actual creek valley has scarcely any tree growth for shelter. Deer may browse there at times but not to the extent they do in the adjoining countryside . . . There is no reason to take 5 quarters of good farm land to provide wildlife with protection and food. The various animal and bird populations will be easily absorbed into the parkland and river valleys in the immediate area. There need be no fears for their welfare . . . weather and illegal hunting are the only things that can do much harm.
>
> - Hazel Paton
> (Alameda transcripts, p. 147)

In addition to the issues of quantity and quality of habitat and the ability to replace it, many are concerned that the SBDA did not adequately study the numbers of animals potentially affected by the project. In the words of the Saskatchewan Wildlife Federation, represented by Ed Begin:

> We understand that it is the responsibility of the proponent to demonstrate the anticipated impacts of project development on the resources of the region and to demonstrate how, if possible, these anticipated impacts will be mitigated. The primary step in this process requires that the proponent gather sufficient information such that a reasonable inventory of potentially impacted resources be presented, and, to the best of their judgement, demonstrate what those impacts will be and why.
>
> In reviewing the EIS prepared by the Souris Basin Development Authority, we can find little comforting evidence that any sincere attempt was made to collect new or to even compile existing data. This, we believe, has resulted in serious underestimates in the assessment of potential impacts unpon wildlife and gross errors in the interpretation of the extent of mitigative measures required to minimize these impacts.
>
> - Ed Begin, Saskatchewan Wildlife Federation
> (Regina transcripts, p. 76)

To augment the wildlife mitigation proposed by the proponent, it is suggested that the SBDA post mitigation bonds for $10 million (Ed Begin, Saskatchewan Wildlife Federation, Regina Transcripts, p. 81) to $15 million (Bob Ewart, Saskatchewan Natural History Society, Regina transcripts, p. 46).

Fisheries

The comments made to the Board about fisheries were often made informally and in conjunction with other topics.

Bob Ewart, representing the Natural History Society, feels that substantial water level changes, poor quality water, blue-green algae blooms, oxygen depletion and potentially high mercury levels will effectively restrict the fisheries potential of the reservoirs (Bob Ewart, Regina transcripts, p. 51).

Clayton Toner and Harvey Hackney from the Estevan Branch of the Saskatchewan Wildlife Federation express the opposite view: that the potential for creating a viable fishery at the Rafferty reservoir is very good. These comments are based on the successful stocking of non-native species of trout in the spoil piles, and the presence of Jack, Walleye and Perch in the Boundary reservoir (Clayton Toner and Harvey Hackney, Estevan transcripts, pp. 20-25).

Natural Vegetation

The topic of natural vegetation garnered public comment with respect to the potential loss of both rare and common plant species. In a written brief submitted by Professor George Ledingham, attention is drawn to the possible negative impact the Rafferty-Alameda project could have on the natural vegetation of the Souris Basin. Specifically, Professor Ledingham cites a paper written by V. L. Harms for the Blue Jay, June 1987, in which the author states there are 20 - 30 rare plant species to be found in the area. A similar reference was made at the Regina meeting to the same article (Bob Ewart, Saskatchewan Natural History Society, Regina transcripts, p. 50).

Ruby Hood, a resident of the Halbrite area, is concerned that building the dams will result in a loss of fruit bearing bushes in the valleys. In her words:

> The Valley is plentiful in its supply of wild fruit. There are saskatoons, chokecherries, raspberries, strawberries, black currants, gooseberries and hawthorns. All of the people in the area at some time in the berry-picking season are down there picking pails of their favourite for pies, jams and jellies. This too we would greatly miss.
>
> - Ruby Hood
> (Weyburn transcripts, p. 129)

Archaeology

In building for the future, we should be careful to preserve our past. This summarizes the sentiment of the comments about the impact of the developments on the heritage resources of the area. Representatives of the Estevan National Exhibition Centre and the Estevan School Division are excited about the potential for developing an interpretive centre in the area - a potential they feel will go unrealized without the Rafferty-Alameda project (Jeannie Perry, Estevan National Exhibition Centre, Estevan transcripts, p. 91).

However, before any interpretive centre can be constructed and our archaeological heritage put on display it must be recovered. It is the assurance that adequate recovery take place that concerns the Saskatchewan Archaeological Society (Eldon Johnson, Saskatchewan Archaeological Society, Alameda transcripts, pp. 42-56). At the Estevan meetings Roy McKague, a member of the Saskatchewan Archaeological Society, summed up their concerns this way:

> The point I want to make is that if the Valley is to be flooded, enough time and money should be allocated to do a proper search of the valley. This will require a much larger force than is doing the preliminary work there now. If this is not done before it is flooded, all the archaeological history of our past inhabitants will be lost forever. Our

prehistoric history dating back some ten to twelve thousand years -- and we find this area has been inhabited that long or longer -- will be lost forever.

- Roy McKague
Saskatchewan Archaeological Society
(Estevan transcripts, p. 123)

Oil

The Board received a detailed and comprehensive written submission from PanCanadian Petroleum Ltd. outlining the impact of the reservoir on their operation and their resulting concerns with respect to the flooding of oil fields in the Souris Basin, particularly those along the Souris River.

The Rafferty Dam will have a great impact on the Weyburn unit. At flood level, the reservoir will back up the Souris River and Roughbark Creek, effectively cutting the Unit into three areas. At the Initial Operating Level of 549.5 m ASL the Souris River reservoir will still isolate the easterly portion of the Unit, while the Roughbark Creek reservoir will project some 2 kilometers into the southern part of the Unit.

- K.R. Parham, PanCanadian Petroleum Limited
(Written brief submitted to Board)

The fundamental concern expressed by PanCanadian is that mitigation standards be set to ensure "that safe operations can continue with a minimum risk of spills or disruption of production." To this end, PanCanadian makes a number of recommendations it believes ". . . necessary for co-existence of the oilfield operations and reservoirs", recognizing that adopting these recommendations may have a substantial impact on the mitigation costs of the project.

Another concern deals with the impact of the project on mineral rights and the future development of oil wells in the Basin.

> The value of the ownership of the minerals is at risk and certainly reduced. I need not remind the Board members that these minerals include oil and natural gas, and there are many oil wells in this community as we all know. While I do not have an oil producing well on the NW of 5, there are oil producing wells in the vicinity, one as close as the SW 1/4 of Section 5 and additional producing wells are all over this community. We can argue that there is or isn't oil on my 1/4 section, but I don't think we can determine that unless we drill a well, and then we may or we may not. I have reasons to believe then that there is a good possibility that a well drilled on my property would have the potential to produce oil from one of two producing depth zones that are known to be drawn from in this area. I believe that my chances of consummating a lease to drill and develop a producing well will be significantly reduced by the presence of the reservoir. This important economic concern should be taken into account in negotiating the acquisitions of land, not only mine, but I am sure there are other land holders in the watershed area that are also affected.
>
> - Herb Lapp
> (Alameda transcripts, pp. 74-75)

GENERAL CONCERNS

The public addressed not only very specific issues relating to construction of the dams, but spoke as well of more general concerns they had with the project. In many instances these concerns have a direct impact on the proposed uses of the reservoirs.

Water Quality

Water quality is one such issue. Many presenters recognize that it is not sufficient simply to supply water; the water must be of acceptable quality too. The Weyburn Branch of the Saskatchewan Wildlife Federation points out that a reservoir with water of insufficient quality would have a negative impact on both wildlife and sport fishing (Lorne Onstad, Weyburn Branch - Saskatchewan Wildlife Federation, Weyburn transcripts, p. 59). Other participants express doubt about the attractiveness of the reservoir for cottaging and related activities if the water is of poor quality, i.e. contain large areas of algae bloom.

Several factors are consistently cited as being potentially detrimental to the water quality of the proposed resevoirs. These are toxins such as agricultural chemicals, natural mineral deposits (especially alkalai) and effluent discharges from centres such as Weyburn and Alameda. John Brown sums up the potential negative effects in this way:

> The Moose Mountain Creek and it's tributaries run through 680 quarters of land in the three R.M.'s of Moose Creek, Moose Mountain and Brock. Just think of the pollution from that many miles of mud, phosphorous, nitrogen fertilizer, town lagoons, pesticides, and everything else that takes a free ride down Moose Mountain Creek. Small creeks were never intended to be dammed - they were created to be flushed out once a year (to get rid of the year's

supply of pollution), to flow to the Hudson's Bay, where it is diluted so much it doesn't create a problem.

- Helen Finucane for John Brown
(Alameda transcripts, p. 66)

Alan Shay of Oxbow sees the problem somewhat differently. He believes the Souris River and Moose Mountain Creek are already polluted due to a lack of controls on farm operations. Introducing water management controls, he feels, will be a benefit (Alan Shay, Estevan transcripts p. 228). Brad Dutton recommends three specific controls be implemented if the project proceeds. These are:

Firstly, the regulations concerning treatment of sewage have to be adhered to. Weyburn may have to upgrade their sewage treatment so as not to have dumping of raw sewage into Rafferty Reservoir. Also, the cottages must have proper sewer systems installed, be it holding tanks or proper collection and treatment of all cottage effluent so as not to have raw sewage being drained or pumped into the reservoir like has been happening at various lakes and reservoirs around the province.

Secondly, the practice of building ice fishing shacks, pulling them on to the ice and when spring comes, abandoning these shacks and leaving the shack and garbage on the ice. This in turn results in scrap lumber floating on the surface which makes it very dangerous to boaters and water skiers alike. Also, this makes the reservoir and shore lines unsightly, which in turn gives people the attitude that the reservoir is a poor place to go for recreation. An excellent example of this is that of Boundary Reservoir.

Thirdly, and possibly the most disastrous is use of barrels that have contained deadly chemicals, motor oil or fuels, for flotation devices on house boats. Some of these drums, not all of them but some, have not been cleaned out and/or made leak proof, and the potential exists for deadly chemicals to be released into the reservoir.

- Brad Dutton
(Estevan transcripts, p. 319)

Hydrology

The briefs presented on the subject of with hydrology dealt primarily with the ability of the dams to fill. Indicative of this concern are the comments of Doug Elsasser at the Regina meetings:

> . . . I wish to remind this assembly that the Souris River and its tributaries are fed by melting snow drifts, not by the Rocky Mountains. Any comparison between the Souris and the Saskatchewan River system . . . is feeble and misleading. The Souris River is not fed by mountain glaciers. With enough snowfall and a slow melt, the river might flow for a month each year. In some years the Souris receives no runoff and doesn't flow at all. How can you maintain water levels in a reservoir and honour downstream water flow commitments when you have a river like the Souris? It's simple. It can't be done.
>
> - Doug Elsasser
> (Regina transcripts, pp. 117-118)

Alma Hoium, a long time resident of the Midale area shares this.

> We do not have our sources in the mountains. Our source is snow pack. . . . haven't had enough runoff in the last years to even fill our hay sloughs. So how can we expect any amount of water to run into the Souris River to supply a sufficient amount of water for this.
>
> - Alma Hoium
> (Estevan transcripts, p. 285)

The data used by the SBDA in their hydrological models for predicting the fill rates of the reservoirs was questioned too.

> It is noted that the proponent chose not to incorporate data from 1982 - 86 in the hydrological models, a series of dry years which would put the project in a poorer light. Climatologists in fact predict the very real possibility of drier conditions on the Canadian prairies in the next several decades.
>
> - J.A. Slimmon & M.H.F. Hey
> Saskatoon Natural History Society
> (Written brief submitted to Board)

Olive Hanson, however, has little doubt about the ability of the dams to fill. In her experience, from living on a farm situated on what is the proposed site for the Rafferty Dam, the area has suffered flooding even in years not known as flood years (Olive Hanson, Estevan transcripts, p. 233).

Land Use

Any discussion about land in Saskatchewan is bound to elicit a great deal of emotion. Farming is more than just a way to earn a living, and land is more than a factor of production. In this province, farming and the land are at the very heart and soul of its heritage. When land, particularly farmland, is placed in jeopardy, the matter warrants serious consideration.

The Board received many briefs from individuals concerned about the loss of productive farmlands and the threat this loss may have on the economic viability of the affected farming operations. Representative of these views are the following comments by Robert Hume and Marilyn Freitag.

> So I believe maybe the government should have more concern over the farms that are going to be wiped out, over the food production, the loss of cattle and grain. Even on our farm . . . where I've lived . . . for well over 70 years, there's been three generations. . . . in the 105 years it's been operating; if you could figure up the number of bushels of wheat, the number of head of cattle that have been produced from that farm, and which will now probably be wiped out entirely. Multiply that by the number of people that are along the valley that depend on the valley for grazing, you're going to fall short of a great amount of food, production of grains, livestock and all sorts of animal products.
>
> - Robert Hume
> (Carlyle transcripts, pp. 39-40)

> You have heard of farmers who are "caretakers of the land" and many are "lovers of the land". I know of several in this room. These loved pastures cannot replaced by other native pastures or land - ever, or by money . . . Many will not be able to find an alternate pasture so will just have to go out of livestock or cut down to a number that will fit on the farmyard or nearby fields. It won't be easy to replace the quality of pasture these farmers now have.
>
> - Marilyn Freitag
> (Alameda transcripts, p. 124)

It was pointed out that, in farming areas, when farms are affected the rest of the community is affected too.

> Out of the area that is proposed to be purchased for the dam, there are presently approximately 1,100 head of livestock sold annually through auction markets, plus another 250 head to a local abbatoir. This amounts to approximately $800,000 revenue for this year, most of which will be spent in this community. This area has been, and still is, the main source of livestock supply to the Alameda Auction Mart. If we lose them, it could be a loss of revenue to our lessee, which in turn could result in an unviable business and possible closure of the mart.
>
> Several young farmers and farmers' wives are employed part-time by the auction mart and if we lose these livestock because of the proposed dam and reservoir, these young people could lose their part-time employment.
>
> - John Wilbraham, Alameda Auction Mart Board (Alameda transcripts, p. 24)

The potential loss of municipal tax revenue was also raised, although some individuals feel that this loss would be more than made up from new taxable entities created by the project.

The Board was also advised that land requirements for the proposed project would have adverse effects not only on land owners, but on hayplot lessees and community pasture patrons as well (Norm Eggum, Estevan transcripts, pp. 216-223, and Alma Hoium, Estevan transcripts, pp. 51-60).

In the situation of forced land sale, compensation is also an issue. Some feel the proposed compensation is adequate, if not generous (Mark Walliser, Estevan transcripts, pp. 170-171). Others believe the compensation offered is inadequate considering the sacrifice people are being asked to

make. The Board received the following comments from John McNeil regarding the SBDA's compensation package:

> I would like to make a few comments, Mr. Chairman, concerning the compensation package for forced sale that the government is offering affected land owners. First, we do not know what we are to receive for the actual land itself. This is still up in the air. Then we are being offered a forced sale figure, a disruption figure and a figure in lieu of leaseback. In my view the proposed package is totally inadequate. We are being given no consideration for the fact that there is virtually no land available with which to replace that which we will lose, let alone 16,000 acres of it. We are being given no consideration for the fact that we have spent a lifetime building our farm and livestock units, we are given no consideration for the fact that if we want to we will have to go 50, 75, 100 or more miles to purchase land to replace that which we lose and then bear the added costs of travel and transportation of livestock to and from these distant places. No consideration for the fact that if we do not and cannot replace this land that the money we receive for it will be taxed. Then we not only lose the land and income off of it but also a big portion of what we receive for it.
>
> - John McNeil
> (Alameda transcripts, p. 21)

With respect to the last point, Mr. McNeil feels tax concessions are warranted when large amounts of money are received by farmers due to the forced sale of their land.

Alternate suggestions for determining the formula for the land acquisition policy were presented to the Board by John Wilbraham who suggests that; 1) industrial rather than agricultural land prices be paid to those losing land (Alameda transcripts, p. 31); and 2) the land be rented to the government as opposed to being sold (Oxbow transcripts, p. 4).

Benefit Cost Analysis

At the outset of this chapter the Board indicated that some of the comments received dealt specifically with the EIS and the methodologies used in its development. An example of this type of comprehensive submission came from Joe Dolecki, Professor of Economics at Brandon University. Prof. Dolecki's brief provides a critique of the benefit cost analysis done by the SBDA. He concludes his remarks with the following:

> On the basis of the above considerations, it is clear that the benefit cost study conducted by the SBDA cannot be used to justify the Rafferty-Alameda Project. From the point of view of rational resource allocation, the project should be discarded. If it does proceed, then it is safe to conclude that the decision to proceed has been made using some other non-rational criteria.
>
> - Joe Dolecki
> (Estevan transcripts, p. 352)

Professor Dolecki is not alone in his observation that the benefit cost analysis for the project does not produce a favorable enough ratio to warrant proceeding with the project. The Saskatoon Natural History Society, in a written brief submitted to the Board, expresses similar sentiments.

> The benefit cost ratio really only reaches a slightly positive value because of an optimistically low discount rate, rather than through collective merits of the project itself. Some supposed "spinoffs" from the project will not be realized for extended periods,

if ever, so probable financial vagaries in future years make the current benefit cost formulae highly speculative.

- J.A. Slimmon & M.H.F. Hey
Saskatoon Natural History Society
(Written brief sumitted to Board)

ALTERNATE PROPOSALS

The desire for better management of the Souris River Basin's water is reflected in virtually all briefs submitted to the Board. What constitutes better water management, however, is subject to interpretation of the needs of the area and its residents. The Board received numerous proposals about how to best manage the basin's water. Several presenters, among them Alma Hoium and John McNeil, want to see several smaller dams built. These people feel the same overall results in terms of flood control and water storage can be achieved by this means rather than by the construction of two larger dams. The following comments by Newton Reed are representative of those made by advocates of this alternative proposal.

But there is another solution to our water runoff problem and it is usually ignored. The third solution, control the flow of water from one end of our water way to the other, within our territory. This can only be accomplished by breaking the whole waterway into smaller sections by the installation of a number of smaller dams.

- Newton Reid
(Alameda transcripts, p. 99)

To members of the public who place a greater value on multi-purpose water objectives, the proposed larger dams are seen as a more viable method of water management. Again, it is clear that the choice of water management options depends on long-term goals. Fundamental differences in the objectives of water management will result in different development proposals.

CONCLUSION

The quotes and comments presented in this chapter are representative of the views expressed at the meetings and through written submissions made to the Board. It is difficult to adequately encapsulate the opinions of close to two hundred individuals and organizations into a few brief pages. The Board has, however, attempted to impart to the reader a basic understanding of the type and range of opinions expressed during the inquiry.

CHAPTER 5: ANALYSIS AND RECOMMENDATIONS

GENERAL CONSIDERATIONS

The Board of Inquiry, having accepted that the SBDA proposal met the four principles of a water management project, proceeded to the final aspects of its mandate which were:

a) to evaluate the adequacy of the SBDA proposal for mitigation of known or potential social, economic and environmental effects of the project;

b) to recommend to the Minister of Environment and Public Safety whether or not the project should proceed and, if so, accompanying conditions (if any). These two steps are covered in this section.

Before analyzing the social, economic or environmental effects of the dams, however, it is necessary to consider three key technical factors: hydrogeology - will the reservoirs hold water, hydrology - will there be enough water, and water quality - will the water be of suitable quality for intended uses. The Board could recommend the project proceed only if these three conditions are adequately met.

HYDROGEOLOGY

In a paper delivered at a seminar at Oregon State University, Harold Hafterson made the following observation,

> Webster defines a reservoir as a place where water is collected and kept for use when wanted. Thus, a place that won't do this is not a reservoir, even though considerable expense and effort may have been expended to construct a dam.[17]

This concept, plus the possible impact of the reservoir on ground water in the area, are the basis for analysis of the hydrogeology portion of the EIS.

The Board is assured that the proponent has undertaken the necessary analysis required to ensure the structure would hold the requisite water and that potential impact on the ground water and appropriate mitigation was considered. As well, Saskatchewan Environment and Public Safety did not raise any concerns with the analysis in the EIS.

The public questioned the possible effect of seepage from the reservoir on the quality of well water in the areas surrounding the Rafferty and Alameda dams. This legitimate concern is adequately addressed by the SBDA in their commitment to secure baseline data and to provide monitoring for hydrological changes that may necessitate mitigation (Appendix C of Chapter 6). It should be noted that the quality of the groundwater is expected to improve as a result of the project.

Problems such as collapse of water well casings, changes in water quality and increase in soil salinity may occur. The proposed mitigative measures (dewatering wells, drilling new wells) are sound and have been effectively employed at other reservoir sites. Should problems of soil salinity downstream of the dams occur as a result of the construction and operation of the dams, the Board recommends that the SBDA (or responsible administrative authority) be held responsible and that they should try to alleviate the problem by using one or all of the techniques cited in the EIS. If these techniques do not work and the land in question is eliminated from its current use, the authority should be responsible for acquiring these lands. The Board is concerned that there be a continuing commitment to mitigation made by the authority charged with the ongoing administration of the Souris Basin. This commitment should recognize the need for mitigation as it is required to deal with expected and unexpected problems caused by hydrogeological changes precipitated by the dams and related appurtenances.

HYDROLOGY

The evaluation of the hydrology of the project centered on two fundamental questions:

1) Is the methodology used to generate the predicted fill rates sound and the values ascribed to the variables accurate, and

2) What level of probability estimate of fill rate does the Board consider acceptable in order for the project to proceed?

The hydrology discussion in the EIS deals with the probability of filling the proposed reservoirs. In other words, is it likely that enough water will be available to provide a sufficient supply for intended uses in a timely manner? This is not an analysis of the adequacy of mitigation, for there is likely no reasonable mitigation available if the reservoirs fail to fill. Rather, the analysis assesses whether or not the estimated probabilities associated with the anticipated fill rate that result from the application of a prescribed model are sufficient to proceed.

The potential water supply for the Rafferty and Alameda reservoirs was simulated by use of the Water Resource Management Model (WRMM) developed by the Government of Alberta. Based on the natural water supply of the area, coupled with present and potential demands for that water, the model is capable of simulating the impact of these factors on the proposed reservoirs over time. In essence, it allows for the prediction of the probable elevation levels for the reservoirs. The flood control capability of the two reservoirs was studied by using another model, HEC-5, developed by the U.S. Army Corps of Engineers. Given the models' wide acceptance by other jurisdictions in similar contexts and in

the technical and scientific communities, the Board accepts the two simulation models as valid for the purposes of this study.

The simulations generated by any model are only as accurate as the variables and related values used in the modelling process. The Board reviewed the variables and finds them to be representative of the supply and demand factors for the Basin. The values used for the variables are based on historical records of known water supply and demand and are the only available estimates of currently anticipated future values. The Board is satisfied that use of historical data is a reasonable method of estimating future events. The variables used for the ascribed demand values for irrigation and the Shand power station are less easily quantified since neither represent present demand factors. The Board accepts, nonetheless, that the SBDA used reasonable values to represent the demand for water for both uses, and that the figures generated by the model are an accurate representation of the probability of filling for the reservoirs based on recorded precipitation and runoff. Actual fill rates, obviously, will be a function of actual precipitation and runoff.

The question is now whether the predicted fill rates are acceptable from a practical point of view. In other words, even if the reservoirs should happen not to reach the Full Supply Level (FSL)[18] within twenty years, will they still be useful?

The scenarios simulated using the WRMM indicate that given the requirement for water by the Shand generating station and the province's apportionment obligations to the U.S.A., there is a seventy percent chance that 4800 ha of new irrigation will be possible in five years. This is based on the premise that new irrigation can be accommodated by the Rafferty reservoir at elevations of 543.5 meters (page 86 of Chapter 7) and that the probability of the reservoir reaching that elevation in five years is approximately seventy percent (figure 3.14 of Chapter 7). Hence, the usefulness of reservoirs is not restricted by their ability to reach full supply level (FSL on Rafferty is at 550.5 meters); full use of reservoirs can be achieved at levels below FSL.

Although the reservoirs are useful at levels below FSL, the Board was concerned that ensuing fluctuations in the water levels of the reservoirs would restrict this usefulness. Initial concerns the Board had in this regard were allayed by hydrographic comparisons between fluctuations at Lake Diefenbaker and those predicted for the Rafferty and Alameda Reservoirs. While fluctuating water levels, particularly from year to year, present less than ideal conditions, they do not present insurmountable problems for the operation of the reservoirs for their intended uses.

Some uses, such as cooling for a generating station, require 100 percent availability of water. The scenarios discussed above presuppose the ability to meet the needs of the Shand station. The Board was concerned that if Rafferty reservoir is unable to meet the demands of its primary users, a contingency plan be in place to mitigate the negative effect of such a situation.

In response to the Board's question, the SBDA suggests that in the unlikely situation that the Rafferty reservoir is unable to provide water to Shand, the short fall could be made up from three alternate sources: 1) treated Estevan effluent; 2) groundwater; and 3) mine water. The proponent is confident, however, that such a scenario will not come to pass. These measures plus the existence of a contingency plan, assure the Board that adequate consideration has been given to this matter. Accordingly, the Board recommends to the Minister of Environment and Public Safety that SPC and SBDA be required to formalize a contingency plan by no later than December 31, 1988, outlining what steps could be taken in a prolonged drought should the Rafferty Reservoir be unable to provide sufficient water for the Shand Power Station.

The Board observed that water demand is a complex issue with many different variables coming into play. This, coupled with the variability of water supply, makes the proper administration of water rights in the Souris Basin very

important. In view of this, the Board suggests that all existing and potential users of the reservoirs' water resources should be aware of the guidelines to be followed in determining the priority schedule for water use (Appendix C of Chapter 7). The Board, therefore, recommends that the provision of this information to the public be a requirement placed on the SBDA.

The Board concluded that, based on the hydrological predictions, proceeding with the project was the appropriate course of action. There is a significant level of risk that "hoped-for" water volumes will not be available but, given clear contingency plans and the recognition that there is a continuum of usefulness at varying water levels, that risk is at an acceptable level.

WATER QUALITY

The quality of reservoir water available for most of the intended uses is as important as the quantity. Uses which include recreation, municipal water supply, fisheries, wildlife and irrigation demand acceptable quality.

The model used to generate predictions about water quality for the Souris Basin (Water Quality Balance Model), after the development of the dams, is acceptable to the Board. The values assigned to the variables used in the model are based on

historical data. The Board accepts the predicted water quality attributes to be an accurate presentation of the quality of water based on past experience of precipitation and run off. This being the case, the assertion made in the EIS, that the water quality of the reservoirs would be similar to that of other water bodies in southern Saskatchewan, is reasonable. Water quality cannot be expected to be perfect or even at a level experienced in other areas of the country or other regions of the province. It is critical to bear in mind that southern Saskatchewan is a water scarce region and that its water resources, in qualitative terms at least, must be judged accordingly. The priority must be placed on constant watchfulness.

The Board recommends that the Department of Environment and Public Safety place an immediate priority on the establishment of water quality objectives on the Souris River and Moose Mountain Creek for all relevant parameters such as, but not limited to, total dissolved salts, mercury, ionized ammonia, dissolved oxygen and boron.

During the public meetings the Board heard a number of comments alleging that the water quality would be unfit for contact recreation or direct consumption by wildlife and livestock, and that problems would result from erosion and farm chemicals. While the Board understands these concerns, it could not find firm evidence to substantiate them.

The Board acknowledges that the high productivity of the land surrounding the proposed reservoirs will produce a high nutrient content in the reservoirs. The impact of the surrounding lands on the water quality cannot be controlled and mitigation is limited. It is important, then, to limit the negative impacts of those controllable factors that affect water quality.

The impact of farm chemicals on the environment cannot be viewed as specific to this project and complete mitigation of these problems is beyond the purview of this inquiry. Instead, this factor must be studied in concert with the broader issues relating to agriculture in Saskatchewan. However, action should be taken to ensure that an existing factor does not worsen the situation and accordingly, the Board recommends that the SBDA implement appropriate land use controls to prevent any increased problems resulting from erosion and farm chemical drainage into the reservoir.

The Board recommends that the monitoring of all effluent destined to enter the Souris River and Moose Mountain Creek be carried out at increased levels. Particular attention should be paid to the Weyburn and Alameda sewage lagoons in order to ensure all appropriate environmental standards are met, and if possible exceeded. In addition, the Board recommends that the SBDA actively pursue alternatives to discharging the effluent into the Souris River and Moose Mountain Creek.

The mitigative measures outlined by the proponent to either protect or correct the water quality of the proposed reservoirs are, in the Board's estimation, appropriate. They represent a realistic mix of active and reactive measures to obtain a supply of the best possible quality of water. Water quality is not seen as a limiting factor in determining the uses of the proposed reservoirs and thus it is not a reason to reject the project.

The three key factors of hydrogeology, hydrology and water quality, with respect to the Rafferty-Alameda project, have been thoroughly evaluated by the Board. The Board is satisfied that these critical requirements are sufficiently addressed in the EIS to permit the project to proceed subject to the recommendations noted above. Therefore, the Board deems it reasonable to proceed with their analysis of the other elements of the project.

LAND USE

This project proposed a change in the use of land. There are two issues requiring evaluation:

(a) the determination of the amount of land required to meet the various objectives of the project; and

(b) the process of acquisition of the necessary lands and compensation to be paid.

In determining the amount of land required for purchase two factors must be considered:

1) the amount of land required for the dams, reservoirs, appurtenances, slumping and erosion;
2) the amount of land required to meet other uses of a multi-purpose project such as wildlife habitat and recreation.

Clearly the latter is somewhat more flexible than the former.

The Board finds the SBDA's stance, or change of stance, in the case of land acquisition for the Alameda Dam, both laudable and troubling. In response to concerns expressed by Alameda landowners regarding the amount of land being proposed for acquisition, the SBDA amended its land acquisition plan and proposed that, in the event negotiations for the purchase of lands fail, only lands required for the dam, reservoir, slumping, erosion and a buffer strip be acquired through forced sale. All lands required for other purposes such as wildlife and recreation would be purchased only through negotiation.

The willingness to amend their purchase policy in deference to area concerns that too much land was being acquired is laudable. However, this new policy, which eliminates forced sale of land for wildlife and recreation uses, could place in question the proponent's commitment to the multi-purpose nature of the project. The Board is concerned that such a change jeopardizes the attainment of land for these two uses.

There does appear to be an adequate supply of available, potentially usable real estate on the market, but the Board recommends that the SBDA proceed with its original policy. The Board recommends the SBDA engage in ongoing consultation with landowners in the Alameda area in order to identify and acquire, by negotiation, land which is appropriate for wildlife and recreation uses, and at the same time minimizes the negative impact on individual landowners and their farming operations. The SBDA should be empowered to acquire necessary land should said land be unavailable through negotiations.

The SBDA developed its own land acquisition and compensation policy for this project. The policy, which received both praise and criticism from members of the public, was compared to similar policies from other forced sale situations (Coronach and Nipawin). Of particular assistance was a report prepared by G. Mumey for L. Barber on the land acquisition at Coronach (Appendix 11 of this report). In reviewing the SBDA land acquisition policy, the Board agrees that it fairly compensates individuals for the forced sale of their land. In addition, the offer of the SBDA to assist individuals in securing suitable replacement lands is noteworthy. The SBDA should be encouraged in this effort.

During the public meetings two alternate suggestions were made with respect to the purchase of private lands. The first, that the owners be paid an industrial price for land rather

than an agricultural one, is based on the premise that the water to be stored on that land would be used, in part, to cool the Shand power plant. On this issue, the Board deems that the value of the land should be based on its current use. If the land is not presently being used for industrial purposes the owner should not expect to receive an industrial price for it.

The second suggestion, that the government lease the land rather than purchase it from the owner, is inconsistent with the use of land for projects of this nature. The Board believes that the government should have clear title, fee simple, on lands used for long term developments such as Rafferty-Alameda.

The Board is satisfied that the mitigation measures for the pasture patrons and hayplot lessees directly affected by the land acquisition for the project are fair and adequate. The Board recommends that for community pastures the SBDA be directed to ensure that mitigation be on a carrying unit for carrying unit basis unless otherwise agreed to by the community pasture(s) in question.

The Board finds the land acquisition policies to be clear and fair. The Board is aware and acknowledges that money does not compensate for the personal losses experienced in situations such as these. Nor does the prospect of purchasing new land replace the memories and heritage associated with the lost land. For these, there is no known mitigation.

Some elements of the land use section did trouble the Board, most notably the agricultural production lost permanently through dam and reservoir construction. On this matter the Board sought proof of potential for increased production on other lands in the area. This matter is discussed in the next section.

IRRIGATION

Irrigation is cited in the cost benefit calculation as one of the major benefits of the Rafferty-Alameda project. Given the potential impact of the project on surrounding lands, the issue of irrigation merited consideration by the proponent and review by the Board.

To assess the impact of irrigation the Board looked at the immediate production losses resulting from the project and the potential benefits to be gained through increased irrigation. In many respects, this is a speculative process tempered partially by the knowledge of the interest expressed by area residents in incorporating the new resources into existing farming enterprises and by the yield experiences in existing irrigation projects.

The EIS cites immediate production losses for hay and cereal crops for the Rafferty region of 1678 ha and 99.5 ha in the Alameda region. Over time, irrigation is projected to take place on 4855 ha of land, of which approximately 3200 ha will be in the Souris River lowlands (page 24, Chapter 13 of the EIS). Accepting the rule of thumb that irrigation doubles production over non-irrigated land, the potential for recouping lost production does exist. This is a simplistic equation since it considers only the production capability lost versus the potential for increased production. It does not consider the economic feasibility of incorporating irrigation into farming practices in the area nor the time required for implementation. These variables are vital to measuring the net benefits of the project. They are affected by the farmers contemplating incorporation of irrigation into their farming operations and depend very much on the entrepreneurial inclinations of these farmers.

The evaluation of net benefits requires predictions of the costs of investing in the necessary irrigation equipment, of the volumes of production to be achieved, of the prices to be obtained on the production, and of the rate at which the farmers in the area will undertake the irrigation project.

The Board accepts the estimates of investment cost and volumes of production as presented in the EIS. The prices used in the evaluation are higher than current prices, but in light

of the term over which these activities will occur. Selecting the median price of a fifteen year period is not an unreasonable way to predict long-run prices. The SBDA used an implementation period of fifteen years. The supposition of full take up in fifteen years was a point of contention during the inquiry. The Board, however, finds no basis to conclude that the rates are unrealistic based on predictions of future economic circumstances and declarations of intent by local resident farmers.

In reality, future irrigation is beyond the ability of the SBDA or the Board to predict or control with great accuracy. The proponent will make the water available for irrigation; the actual act of irrigating will be left to individual entrepreneurs to undertake as their needs and resources dictate.

The estimates used in the cost benefit analysis are subject to considerable uncertainty. Decisions based on this analysis must recognize the existence of this uncertainty. The Board acknowledges this fact and acceptes the predicted values subject to this caveat.

NATURAL VEGETATION

An assessment of the environmental impact of a project often tends to concentrate on the fauna of an area and to overlook the flora. This can be dangerous, for in neglecting

the potential impact on the natural vegetation of the area it becomes all too easy to lose forever one more living thing.

The Board received a number of comments from the public about the lack of studies done by the proponent in assessing the impact of the project on the natural vegetation in the Alameda area. When the EIS was filed, the SBDA made a commitment to complete the required studies. On November 19, 1987, the Board received (from the proponent) a copy of the draft report titled "Vegetation Resources of the Proposed Alameda Reservoir with Special Emphasis on Rare Plants". This report indicates that the SBDA had undertaken a detailed study of the natural vegetation and that due consideration had been given to the impact of the project on the plants within the affected area.

The Board was informed in the public meetings that several species of rare plants could be negatively affected by the proposed project. At the December meeting the proponent was asked specifically about these plant species. The proponent assured the Board that in their investigations of the Rafferty and Alameda areas no plant species were found in the project area that were not also present in areas of the valley that would not be inundated. In specific response to concerns about rare plant species found in the Roche Percee area,[19] the proponent stated that the project would have no negative impact on the plants there. Based on the studies submitted by the proponent, the Board accepts this claim.

HERITAGE RESOURCES

The Saskatchewan Archaeological Society brief requested the Board of Inquiry to "determine whether or not the time and manpower allocated for survey and for all necessary mitigation are adequate." This is the approach taken by the Board in reviewing the proponent's mitigation proposal for heritage resources.

The Board is convinced that the SBDA consultant did a thorough analysis of the archaeological resources in the project area. This was done in accordance with guidelines provided for such studies by the Archaeological Resource Management Section, Heritage Resources Branch, Saskatchewan Parks, Recreation and Culture (SPRC) (the provincial regulatory body which administers The Heritage Property Act). Based on the analysis for the SBDA and on the responses to questions at the December 3rd meeting, the Board is confident that an adequate baseline assessment has been made of the area's Heritage resources.

To determine whether or not the proposed mitigation is adequate, the Board considered two techniques for calculating a monetary figure. One method, used by the U.S. government for assessing the adequacy of mitigation for development on Federal

lands, examines the percentage of total project cost devoted to archaeological mitigation. For their assessment of mitigation, a general rule of thumb of one percent of project cost is used. Another method, used in Alberta, examines the number of sites involved rather than an absolute percentage of project cost. For the sake of comparison, the Board reviewed the money spent on heritage resource mitigation at Nipawin. The Nipawin project, with a total project cost of $521 million, spent approximately $2.35 million on heritage resource mitigation - a commitment of .45 percent of project cost. Viewed from the perspective of the number of sites involved, the project encompassed 29.50 ha of land and contained 261 sites. Thirty sites were excavated; nine of these were considered to be large.

The Rafferty-Alameda project, by comparison, has a commitment of slightly more than one percent of project cost devoted to the mitigation of heritage resources. The initial assessment of heritage resources in the Rafferty area lists 219 sites. Had the dam site at line "A" been the final choice, the Board would have had some concerns about the adequacy of mitigation. However, by moving the Rafferty site further downstream fewer significant sites, in the Board's estimation, will be affected by the development. Although agreeing with the proposed mitigation, the Board is aware that presently unforeseen finds may occur during the construction and implementation of the project. The Board recommends that the proponent be held responsible for the documentation, assessment

and salvage of any significant unexpected finds that may occur as a result of developments surrounding the Rafferty and Alameda dam project.

TRANSPORTATION

Saskatchewan has one of the best developed networks of roads and highways in Canada. Where other provinces can rely on both ground and water transportation to keep the flow of goods and people moving, Saskatchewan must rely almost exclusively on land transportation. Indeed, ground transportation is the backbone of this province's agricultural economy. While the provincial government is responsible for the construction and maintenance of highways, it is the responsibility of the Rural Municipalities to oversee the provision of secondary roads to meet the needs of rural residents.

The Board believes that any inadequacies in the proposed mitigation for transportation would have been raised by the R.M.'s affected by the development. Since no concerns were forthcoming about transportation in the Rafferty area either at the public meetings or through written briefs, the Board concludes that the mitigation proposals outlined in the EIS are adequate. This, the Board feels, is due to the proponent's commitment to consultation with the area R.M.'s in the preparation of the proposal.

The situation is somewhat different in the Alameda area. The affected R.M. of Moose Creek No. 33 feels it has not been adequately informed of the potential impact of the Alameda dam and reservoir on the municipality. The SBDA has assured the Board that they have initiated meetings with the R.M. of Moose Creek in an attempt to clarify any outstanding transportation issues.

The Board recommends proceeding with the transportation mitigation outlined in the EIS and that the SBDA continue to consult with all R.M.'s affected by the proposed development, with special consideration for the R.M. of Moose Creek.

The Board is concerned about an issue partially related to transportation, namely, the safety of the general public during construction in areas where heavy equipment will be operated. Accordingly, the Board recommends the Minister direct the SBDA to restrict public access to clearly designated areas for viewing construction activities.

GEOLOGY & MINERAL RESOURCES

Oil spills represent a frightening and serious environmental hazard. It is absolutely essential that every precaution be taken to avoid such a disaster in the Souris River Basin.

Although the importance of and the impact of the project on coal, sand and gravel resources is recognized, the impact on oil resources is seen to be the most significant. The SBDA indicates that most, if not all, economically extractable gravel will be required for the construction of the dams and related structures. The Board recommends to the Minister that if economically extractable gravel remains after construction it be mined and stockpiled by the SBDA for other uses.

The Board has one fundamental and overriding concern about the adequacy of mitigation for oil resources. The potential risks to the environment due to contamination from the operation of the area oil fields must be reduced as much as possible. The Board is concerned about the stringency of existing guidelines governing situations where oil wells and related appurtenances are located in close proximity to bodies of water. The Board, therefore, recommends that Saskatchewan Energy and Mines proceed with establishing necessary policies and guidelines for mitigating the impact of inundating existing oil fields. Guidelines should be set for shutting in and flood proofing existing wells, and particular attention should be paid to establishing high standards for the existence of flow and gathering lines which are in close proximity to a body of water.

The costs and types of oil field mitigation cited in the EIS are reasonable and within the bounds of the project. However, it should be noted that items still under negotiation, regulations set by Saskatchewan Energy and Mines, and recommendations by this Board may have an impact on the final dollar figures. Alameda oil field mitigation costs were not sufficiently defined and analyzed and may also increase the mitigation costs of the project. These additional costs must be considered and allowed for in reviewing the mitigation package for the project.

In summary, the Board recommends that:

- the regulatory standards set by Saskatchewan Energy and Mines be met and, if possible, exceeded;
- no active pipelines or flowlines of any type, regardless of the substance they carry, be allowed to remain under the reservoirs without the approval of Saskatchewan Energy and Mines and Saskatchewan Environment and Public Safety; and
- all labour standards governing occupational health and safety on oil field operations be strictly adhered to.

RECREATION

The proposed Rafferty and Alameda reservoirs provide opportunity for recreation development in the Souris Basin by both private and public interests. The SBDA's commitment to

fund two-thirds of the approximate $8.3 million cost of developing a recreation infrastructure for both Rafferty and Alameda is commendable. Such an infrastructure will include fencing, tree planting, camp sites, marinas and playgrounds to name only a few items. The Board is concerned, however, that a commitment for the other third of the public expenditure is alluded to but not substantiated. Clearly, this issue must be resolved during the completion of the preliminary Park Plan by SBDA.

The overall success of recreation development for the area is also contingent upon private interests investing the estimated $2 million for cottage development on the two reservoirs and at Dr. Mainprize Park. The SBDA is proposing the creation of an attractive opportunity for private investment by providing a quality recreational infrastructure. The Board is unable to judge whether this private investment will be forthcoming. Clearly, a strong promotional effort must be linked to a sound recreational plan if projected developments are to occur.

Concerns raised regarding the overstatement of benefits accruing to the project through recreation were considered by the Board. As with irrigation, the realization of these potential benefits is dependent upon future activities which are impossible to predict. The potential benefits of recreation to the project follow a probability distribution

from low to high benefit values and are dependent on a number of variables. In choosing an average of 72 days/year for cottage use (p. 40 of Chapter 17) and a value of $21.03 per visitor day (p. 6.13 of Chapter 3) the SBDA may be determining the benefits of recreation at the high end of the probability distribution. In doing so, it has made the planning and administering of recreation activities vitally important to the overall success of recreational development in the area.

The potential fluctuation of water levels on the reservoirs is not seen by the Board to be a limiting factor for recreational development. Successful recreation facilities have been established on other Saskatchewan reservoirs (for example: Diefenbaker and Blackstrap Lakes) which also experience fluctuating water levels. Sound operations of the project will allow successful recreational development.

Two recreation concerns do require mitigation, however: Dr. Mainprize Park and the Lutheran Bible Camp. With respect to the former, the Board recognizes the important contribution Dr. Mainprize made to the area during his lifetime. The Board also recognizes the emotional issues surrounding the impact of the proposed development on Dr. Mainprize Park. However, the Board is satisfied that the SBDA has made adequate mitigation available by offering to relocate the park. Since the Dr. Mainprize Regional Park Authority passed a motion at a March 11, 1987, meeting indicating that should the Rafferty project

proceed they wished to relocate the park to a new site on the reservoir, the Board believes that they too agree to the proposed mitigation proposal.

The other existing recreation site requiring mitigative measures is the Lutheran Bible Camp. The SBDA has offered the Camp a choice of mitigative measures. The Camp has yet to make a final choice. The Board has not received any indication that the Bible Camp is dissatisfied with the mitigative offers made by the SBDA, therefore, the Board assumes the offers are adequate.

With regard to recreational development, the Board recommends that:

- the SBDA proceed with the development of a Souris Basin Park Plan component and that input into such a plan should be actively sought from the residents of the two reservoir areas;
- the Minister direct the SBDA to obtain a firm commitment for the other third of the funds required for recreational development prior to commencement of construction;
- the SBDA follow through with the mitigative measures outlined for Dr. Mainprize park and the Lutheran Bible Camp when a final choice of location is made.

WILDLIFE

The impact of the project on the human residents along the Souris River and Moose Mountain Creek are addressed in the land use section of the EIS. It is essential, however, to consider the impact on wildlife and habitat as well. And, once duly considered, is the proposed mitigation adequate?

The Board received input from the public on these two points. Indeed, the range of input was considerable. Some feel too much attention is being given to wildlife at the expense of area residents, while others feel the existence of wildlife is being threatened to suit man's needs.

Analyzing the potential impact on wildlife is made more difficult given that some of the species in question are not indigenous to the region. The white-tailed deer are a good example. While the Board does not intend to infer that because these deer adopted the area they are not entitled to protection, it is obvious they are very adaptable creatures.

Much of the discussion about the deer focusses on the number of animals in the area. Neither the proponents nor the critics of the project have produced, to the Board's satisfaction, a reasonably accurate estimate of the deer population in the area. The problem is further compounded by concentrating on the Souris River and Moose Mountain Creek in

their entirety and not solely to those portions that will be directly affected by the project.

A more useful area of focus is the proposed mitigation, specifically the replacement, enhancement and protection of habitat. It is abundantly clear that, as in land use, a strict acre for acre comparison of habitat is unproductive. The ability of a unit of land to support wildlife is as dependent upon the type, quality and quantity of vegetation it supports as it is on surface area alone. Therefore, the proponent's contention that the 4550 ha of wildlife habitat lost at Rafferty can be replaced by 2900 ha of acquired, protected and enhanced habitat is theoretically possible as long as the quality of the habitat exceeds that lost and hence, can support more wildlife. The question remains - can replacement habitat be created?

The Board has been assured that under a dedicated and vigilant management program, lost habitat can be replaced by habitat capable of supporting the same or greater numbers of wildlife. The process is not, however, instantaneous. Displacement of some species until the enhanced habitat becomes established may occur. This may be especially true for the white-tailed deer, but they will adapt and continue to inhabit the Souris River and Moose Mountain Creek areas.

Subsequent studies on the wildlife in the Rafferty and Alameda reservoir areas were provided in mid-November to the Board of Inquiry. These were SBDA's preliminary draft reports titled, Wildlife Investigations Pertaining to the Proposed Rafferty Reservoir During Spring - Fall, 1987 and Wildlife Investigations Pertaining to the Proposed Alameda Reservoir During Spring - Fall, 1987. In the Board's estimation, these studies and those of the EIS indicate the impact on other wildlife species to be minimal and the potential for effective mitigation to be high. Indeed, the production of upstream wetlands and island habitat should prove to be a haven for waterfowl.

The Board concurs with the SBDA approach to wildlife habitat replacement and recommends to the Minister that the SBDA be directed to provide unit for unit habitat (i.e. no net loss) mitigation for the following species and that these be designated under The Critical Wildlife Habitat Protection Act:

- waterfowl
- uplands game
- white-tailed deer

The Board is puzzled over the lack of concern demonstrated by wildlife groups for threatened species such as the Ferruginous Hawk. Such groups have chosen instead to exercise the greatest concentration of effort on common and abundant sports species such as ducks, geese, upland game birds and

deer. In the Rafferty reservoir area, six of eleven active raptor nests will be inundated - one of which is a Ferruginous Hawk nest.

The Board, therefore, recommends that the SBDA pay special attention to mitigating the negative impact of the project on any rare, threatened and endangered species found in the project area.

To the Board, the issue of wetlands drainage is one of the most serious and troubling aspects of the Rafferty-Alameda Project. The Board recognizes that wetlands throughout the Great Plains are threatened because of drainage and recent climatic conditions which are resulting in significant losses of waterfowl habitat. The issue is troubling because the wetlands currently being monitored within the Souris Basin are outside the jurisdiction of the SBDA.

The Board is aware of the disfunctional nature of the existing provincial mechanism for dealing with the wetlands issue and its inability to reconcile the often conflicting land uses of agriculture and wetlands. The Board knows of successful wetlands programs such as The Heritage Marsh Program as well as the The North American Waterfowl Management Plan which make provision for the retention of wetlands with the co-operation of the agricultural sector.

Within the spirit of these programs and with the intention of preserving as many wetlands as possible, the Board recommends that:

- no additional drainage be permitted in order to speed the filling of the reservoirs;
- the moratorium on all wetlands drainage in the Souris Basin be continued until December 31, 1989;
- during the intervening period all interested parties be consulted in order to design a revised policy and decision-making mechanism specific to the Souris Basin for dealing with wetlands issues;
- primary responsibility for co-ordinating this effort be vested in SWC and that all appropriate individuals and groups be consulted;
- SWC be directed to submit the plan for dealing with the wetlands issue to Saskatchewan Environment and Public Safety no later than July 1, 1989.

In summary, the Board believes short term displacement of some wildlife due to the proposed project may occur, but the long-term habitat enhancement along the reservoir and in the uplands will compensate for the quantity and quality of land initially lost. In sum, the Board believes the proposed mitigation package is adequate and comprehensive. However, the Board strongly recommends that the SBDA continue to work closely with wildlife groups to ensure that the project continues to be sensitive to the needs of area wildlife.

FISHERIES

The Souris River and Moose Mountain Creek, by their very nature, do not currently provide a good environment for fish. The sporadic flow causing poor water quality and stretches of dry river bed place severe limits on the quality and quantity of fish which can survive in each of the two systems. Given the above, the Board is of the opinion that the proposed Rafferty-Alameda project could greatly enhance the fisheries on both the Souris River and Moose Mountain Creek.

The Board believes the development of a Fisheries Management Plan is essential to the future success of sport fishing in the reservoirs. Therefore, the Board recommends that SBDA proceed with the development of such a plan and that it be presented to Saskatchewan Environment and Public Safety by January 1, 1990.

Since the potential for high levels of mercury in the reservoirs is a concern, the Board recommends continued monitoring of mercury levels in fish caught in the two reservoirs and downstream.

ALTERNATE PROPOSALS

Proposals for alternate development were put forward during the public meetings. The alternate proposal most frequently aired recommended the construction of a series of small dams along the Souris River and Moose Mountain Creek. In view of the frequent references to this proposal, the Board considered it further.

The advocates of the small dam proposal agree that such structures would provide the flood control required by residents along the river at a reduced cost, both monetarily and in terms of environmental disruption. Small dams, it is said, will take up less area and hence cause less disruption to farms along both waterways. Clearly, certain multi-use objectives such as large scale recreation developments and water provision for industrial development would not be achieved. However, to the residents supporting the alternate proposal, these objectives are not a priority.

The Board duly considered the reduction in potential uses with the overall cost of building small dams. In analyzing the alternate proposal the Board found that small dams are less efficient than large dams for the following reasons:

1) small dams flood a greater area to achieve the same storage volume - that is more land would be required with greater negative impact on wildlife, archaeology, and agriculture;

2) surface area-volume ratio would be changed resulting in proportionately greater evaporation;

3) small dams are more costly to construct, operate and maintain;

4) small dams increase the potential for "breaching" in major floods;

5) small dams allow limited recreational and fisheries potential;

6) small dams offer poorer water quality;

7) small dams would not have an adequate supply of water for irrigation.

If both proposals serve to guarantee the same amount of flood protection, and as such, start from the same base, they must then be analyzed on the basis of other benefits and their relative cost. Viewed in these terms, the SBDA proposal is more efficient since it provides greater benefits at similar or lower costs. The small dam proposal will not result in lower construction or disruption costs, and will not provide benefits to the same extent.

The Board, therefore, concludes that the small dam proposal is not a viable alternative to the large dam proposal.

The second alternative the Board was asked to consider involved forgoing the American funding and not provide flood protection for Minot. This could mean building the Rafferty

dam but not the Alameda dam, or building both structures on a smaller scale.

At all times during the course of the inquiry the Board has viewed Rafferty-Alameda as one development project for the Souris Basin and not as separate, independent projects. In this light, aside from extrapolating out the costs of Alameda and subtracting the U.S. funding, no information is available on the Rafferty component on its own nor on two smaller structures. At no time has the Board considered the merits of developing Rafferty exclusive of Alameda. Hence, the Board has determined that it must render its recommendations on the entire project as proposed and not on each of the four components (Rafferty dam, Alameda dam, the diversion channel and the downstream channelization).

PROJECT MANAGEMENT

The Rafferty-Alameda project, as proposed, will require considerable mitigation beyond the expected completion date of the dams themselves. As originally conceived, the SBDA will sunset after completion of the construction of the dams and related facilities. Ownership and responsiblilty for operation of the facilities will then be transferred to the SWC. Little, if any, consideration appears to have been given to ensuring that the remaining mitigation activities are handled. At the

December meeting, the SBDA told the Board that a single agency responsible for the mitigation activities may be proposed. Full details of this proposal had yet to be worked out with various interests in the Souris Basin and related government agencies.

The Board has serious concerns regarding the fulfilment of mitigation commitments if a single agency is not held accountable. This concern stems from the magnitude of the mitigation program being proposed; the EIS proposed mitigation efforts in wildlife, archaeology, water quality, hydrogeology, land use, transportation and mineral resources, to list just the major areas.

Under the operating scenario initially proposed by the SBDA, the Board presumes that individual government departments will be responsible for carrying out these responsibilities. Upon project approval under this scenario, the Board is concerned that mitigation commitments will remain unfulfilled. This appears to have occurred in other river systems in the province. Jurisdictional changes within the provincial government make the continuous monitoring of mitigation commitments much more difficult. It is the view of the Board that this must be avoided at <u>all</u> costs. While the Board recognizes the value of consultations with various agencies and interest groups before any plan is adopted, it strongly believes that a single agency be held responsible for all activities related to ongoing mitigation for this project.

Accordingly, the Board recommends that:

- the Souris Basin Development Authority be directed to produce a detailed management strategy for the Souris Basin on the basis of single-agency responsibility for all mitigation activities;
- this plan be presented to Saskatchewan Environment and Public Safety for approval no later then January 1, 1989;
- the title "Souris Basin Development Authority" be retained for the ongoing administrative body supervising the Souris Basin although it is recognized that the Saskatchewan Water Corporation will retain authority over the hydrological elements of the project and its operation;
- the board of the ongoing authority be comprised of representatives from the following organizations: Saskatchewan Water Corporation, Saskatchewan Power Corporation, Saskatchewan Parks, Recreation and Culture, Saskatchewan Energy and Mines, Saskatchewan Environment and Public Safety, Saskatchewan Agriculture, appropriate interest groups, appropriate Chambers of Commerce, affected municipalities and representatives of the general public in the area;
- this authority be given full statutory powers, including the authority to implement land use controls, in order to effectively manage the resources of the Souris Basin including the existing Boundary reservoir.

CONCLUSION

The benefit cost analysis contained in the EIS and raised briefly in Chapter 4 is an area of concern for the Board.

Benefit cost analysis is an attempt to translate the evaluation of a project into a relatively simple index. Certain types of projects are more easily analyzed than others. Multiple objective water projects, for example, do not lend themselves easily to benefit cost methodology for a variety of reasons: the various outputs flowing from the numerous objectives, the competing claims for a common resource and the non-static nature of multiple objective water projects. Irrigation - its take-up rate, the kind of irrigation that will occur and the crops that will be produced - is demonstrative of the non-static nature of the Rafferty-Alameda project.

Appropriate methodological approaches to projects such as Rafferty-Alameda are the topic of much debate primarily because of the difficulties in applying benefit cost analysis to multiple objective water projects. At the public meetings, references were made to the report by Water Resource Consultants, Ltd.[20] dealing with certain aspects of Rafferty-Alameda and how the results of this report, commissioned by SWC, contradicted those of the SBDA Benefit Cost Analysis. The key issue in the debate involved the

inclusion of indirect benefits in the benefit cost analysis calculation.

Indeed, discrepancies do exist between data used in the benefit cost calculations and in other appendices of the report. The discrepancies reflect an inadequate editorial effort on the part of the SBDA in reconciling data throughout the EIS. One submission to the Board points out that on the basis of the data contained in other sections of the report, the benefit cost ratio should be adjusted downward by approximately 2.5 percent. A great deal of effort would be required to investigate this claim, and quite simply, this 2.5 percent is not a significant amount considering the estimating procedures used to generate basic data for all benefit cost analysis regardless of the nature of the project.

Provision is made in the surface hydrology section to cool two units at the Shand Power Station. In the benefit cost analysis, however, provision is made for the value of only the first power unit ($20.3 million). This is done because there is no precise date for bringing the second unit on-stream. Nevertheless, there are some very real benefits to the project for wet-cooling the second Shand unit. Although these benefits are not likely to be equal to the $20.3 million amount of the first unit, they may very well come close to it. Being more definitive about the value of the second Shand Unit is difficult if not impossible. It will depend, among other things, on the date of implementation and the state of

technology at the time. However, because the second Shand Unit is not taken into account, the benefits in this regard are underestimated.

Another element cited as a project benefit is the contribution of $41 million (1985 U.S. dollars) toward the construction of Rafferty-Alameda in order to obtain flood protection for Minot, North Dakota. The Board is of the opinion that in order for this to be considered a benefit of the project as proposed, a clear, irrevocable commitment to the provision of this funding should be obtained from the United States.

In conclusion, the decision to recommend proceeding with the Rafferty-Alameda project is based upon an overall evaluation of the reasonableness of the expected values and potential distribution of the costs and benefits. In many cases, these amounts are subjective and not easily quantified. There may be methodological problems with the benefit cost analysis done by the SBDA. Some estimates are subject to considerable uncertainty that makes any single estimate of limited value.

Despite these difficulties, the Board has not seen evidence to reject the claimed measures of benefits and costs. It has seen evidence of attempts to identify the distribution of possible outcomes of these benefits and costs that allows a decision-maker to undertake the project with a full

understanding of the risks involved. The Board believes that the project has the possibility of providing significant net benefits to the region and to the province and, yet by means of appropriate levels of mitigation, the probability of incurring a severe environmental cost is relatively low.

The Board, therefore, recommends granting the Souris Basin Development Authority the appropriate license to proceed with the Rafferty-Alameda project subject to the carrying out of the recommendations presented in this report and summarized in Chapter 6.

CHAPTER 6: SUMMARY

RECOMMENDATIONS

The following chapter contains a summary of the recommendations of the Rafferty-Alameda Board of Inquiry and the mitigative measures committed to by the Souris Basin Development Authority in the Environmental Impact Statement.

The Rafferty-Alameda project has been proposed as a multi-use water management project. An essential component of which has been the provision of flood protection for all residents of the Souris Valley, including those of Minot, North Dakota. The following approval presumes the existence of an irrevocable commitment on the part of the United States to contribute $41 million (U.S. 1985) dollars in support of the costs of the project as presently proposed.

The Board recommends to the Minister of Environment and Public Safety that approval be given to the Souris Basin Development Authority to proceed with construction of the Rafferty-Alameda projects subject to the following recommendations.

1. Should soil salinity problems occur downstream of the dams, the Souris Basin Development Authority should attempt to alleviate the problem by employing one or all of the techniques cited in the Environmental Impact Statement. If these techniques fail the Authority should be responsible for acquiring these lands through the procedures used in the land acquisition policy.

2. Saskatchewan Power Corporation and the Souris Basin Development Authority should provide Saskatchewan Environment and Public Safety with a detailed contingency plan, no later than December 31, 1988, outlining what steps will be taken if the Rafferty reservoir is unable to provide sufficient water for the Shand generating station.

3. All existing and potential users of the reservoir's water resources should be informed by the Souris Basin Development Authority of the guidelines to be followed in determining the priority schedule for water use.

4. The Department of Environment and Public Safety should place an immediate priority on the establishment of water quality standards on the Souris River System for all relevant parameters.

5. The Souris Basin Development Authority should implement appropriate land use controls to ensure that problems resulting from erosion and farm chemical drainage into the reservoir do not increase.

6. Additional monitoring of all effluent destined to enter the Souris River and Moose Mountain Creek, with particular attention to the Weyburn and Alameda sewage lagoons, should be undertaken.

7. Alternatives to discharging effluent into the Souris River and Moose Mountain Creek should be actively pursued.

8. The Souris Basin Development Authority should be empowered to acquire sufficient land for all objectives of the project in the area surrounding the Alameda dam and that the identification of appropriate lands for these uses be done in consultation with area land owners in an attempt to minimize the negative impact on individual land owners and their farming operations.

9. The Souris Basin Development Authority should be directed to mitigate, insofar as community pastures are concerned, on a carrying unit for carrying unit basis or as is otherwise agreed to by the community pastures in question.

10. The Souris Basin Development Authority should be held responsible for the documentation, assessment and salvage of any significant unexpected heritage resource finds that may occur as a result of developments surrounding the Rafferty and Alameda dam project.

11. The Souris Basin Development Authority should proceed with the transportation mitigation outlined in the Environmental Impact Statement and be directed to consult with R.M's affected by the proposed development with special consideration for the R.M. of Moose Creek.

12. The Souris Basin Development Authority should restrict public access to clearly designated areas for viewing construction activities.

13. Economically extractable gravel remaining after construction should be extracted and stockpiled by the Souris Basin Development Authority for other uses.

14. Saskatchewan Energy and Mines should be directed to proceed with establishing stricter policies and guidelines for mitigating the impact of inundating existing oil fields.

15. The existing regulatory standards set by Saskatchewan Energy and Mines with respect to all aspects of oil well mitigation should be met and, if possible, exceeded.

16. No active pipelines or flowlines of any type, regardless of the substance they carry, should be allowed to remain under the reservoirs without the approval of Saskatchewan Energy and Mines and Saskatchewan Environment and Public Safety.

17. All labour standards governing occupational health and safety on oil field operations should be strictly adhered to.

18. The Souris Basin Development Authority should proceed with the development of a Souris Basin Park Plan component and that input into such plan should be actively sought from the residents of the two reservoir areas.

19. The Souris Basin Development Authority should be directed to obtain a firm commitment for the other third of the funds required for recreation development prior to commencement of construction for recreational facilities.

20. The Souris Basin Development Authority should follow through with the mitigative measures outlined for Dr. Mainprize Park and the Lutheran Bible Camp when a final choice of location is made.

21. The Souris Basin Development Authority should be directed to provide unit for unit habitat (i.e. no net loss) mitigation for the following species and that these be

designated under The Critical Wildlife Habitat Protection Act: waterfowl, uplands game and white-tailed deer.

22. The Souris Basin Development Authority should pay special attention to mitigating the negative impacts the project may have on any rare, threatened and endangered species found in the project area.

23. Consistent with the spirit of The Heritage Marsh Program and the North American Waterfowl Management Plan, no additional drainage should be permitted in order to speed the filling of the reservoirs.

24. The moratorium on all wetlands drainage in the Souris Basin should be continued until December 31, 1989.

25. All interested parties should be consulted during the intervening period to design a revised policy and decision-making mechanism specific to the Souris Basin for dealing with wetlands issues. Primary responsibility for co-ordinating this effort should be vested in Saskatchewan Water Corporation.

26. Saskatchewan Water Corporation should be directed to submit the plan for dealing with the wetlands issue to Saskatchewan Environment and Public Safety by no later than July 1, 1989.

27. The Souris Basin Development Authority should continue to work closely with wildlife groups to ensure the project continues to be sensitive to the needs of area wildlife.

28. The Souris Basin Development Authority should proceed with the development of a Fisheries Management Plan to be presented to Saskatchewan Environment and Public Safety by January 1, 1990.

29. The Souris Basin Development Authority should continue the monitoring of mercury levels in fish caught in the two reservoirs and in the downstream portion of the Souris River.

30. The Souris Basin Development Authority should be directed to produce a detailed management strategy for the Souris Basin on the basis of single-agency responsibility for all mitigative activities.

31. The aformentioned management strategy should be presented to Saskatchewan Environment and Public Safety for its approval no later than January 1, 1989.

32. The title "Souris Basin Development Authority" should be retained and applied to the ongoing administrative body supervising the Souris Basin.

33. The ongoing Authority's board should be comprised of representatives from the following organizations: Saskatchewan Water Corporation, Saskatchewan Power Corporation, Saskatchewan Parks, Recreation and Culture, Saskatchewan Energy and Mines, Saskatchewan Environment and Public Safety, Saskatchewan Agriculture, appropriate interest groups, appropriate Chambers of Commerce, affected municipalities and representatives of the general public in the area.

34. The ongoing Authority should be provided with full statutory powers, including the authority to implement land use controls, in order to effectively manage the water resources of the Souris Basin, including the existing Boundary reservoir.

SUMMARY OF MITIGATION

The following is a summary of the mitigation proposed by the Souris Basin Development Authority in the Environmental Impact Statement. The Board understands that some of these figures may no longer be accurate due to changing circumstances, and that subject to ongoing negotiations and the recommendations of this Board these figures may change again. This notwithstanding, the Board views these proposals as a commitment made by the Souris Basin Development Authority that should be acted upon by the Authority.

WILDLIFE MITIGATION - RAFFERTY

On Valley Floors Above FCL	$ 87,800
Within Midale Pasture	138,500
Block Plantations	257,300
Long Creek	337,000
Dead Lake Channel	50,150
Downstream Alternative Lands	243,750
Reduce Grazing/Habitat Conflicts	146,000
Island Designations/Enhancement	70,000
Critical Habitat Purchase/Design	200,000
Alternative Wetlands #705	192,000
Dead Lake Channel Wetlands	119,500
Coal Spoil Area East of Estevan	56,000
Ecological Reserves/Natural Areas	140,000
Downstream Habitat Enhancement	50,000
Artifical Nests (Raptors)	10,000
Depredation Trust Fund	750,000
Operation & Maintenance (10 yrs.)	375,000
Sharp-tailed Grouse Study	93,500
White-tailed Deer Study	269,000
Monitoring (10 yrs.)	200,000
TOTALS	$3,785,500

WILDLIFE MITIGATION - ALAMEDA

Block Plantations	$ 257,300
Downstream	65,000
Reduce Grazing Conflicts	70,000
Critical Habitat Replacement	150,000
#603 Wetlands/Fisheries	75,000
Raptor Nests	5,000
Operation & Maintenance (10 yrs.)	350,000
Monitoring	100,000
TOTALS	$1,072,300

NOTE: Souris Basin Development Authority responsible for two-thirds of the following recreation costs

RECREATION

LOWER RAFFERTY PUBLIC PARK (excluding land)

Access Roads	$ 420,000
Parking	120,000
Dust-proofing roads/parking	200,000
Power, streetlights, phone	120,000
Water supply/distributionq	120,000
Sewage collection/disposal	180,000
Boundary fencing	80,000
Fireguards	50,000
Irrigation	180,000
Landscaping/Streets	100,000
Beach development	60,000
Boat launch/marina/piers	250,000
Storage building	60,000
Maintenance equipment	100,000
Campgrounds (60)	180,000
Motorhome sites (30)	225,000
Campground services building	90,000
Visitor viewpoint	50,000
Park entry gate	50,000
Day use facilities	50,000
Beach change facilities	140,000
Sports fields	20,000
Play equipment	50,000
Trail development	20,000
Park office/Visitor Centre	400,000
TOTAL	$3,315,000

SBDA portion (2/3 of $3,315,000) $2,210,000

RECREATION - Cont'd

ALAMEDA PUBLIC PARK (excluding land)

Internal Access Roads	$ 112,000
Parking	60,000
Dustproofing	50,000
Power/street lights	60,000
Water supply/distribution	80,000
Sewage disposal	80,000
Boundary fencing	12,000
Irrigation	60,000
Landscaping	60,000
Storage Building & Equipment	60,000
Beach development	40,000
Marina/boat launch/pier	90,000
Campground (40 sites)	120,000
Cabin Trailer sites (20)	150,000
Camp service centre	90,000
Visitor Viewpoint	40,000
Park entry	50,000
Day use/picnicking	50,000
Toilets/change building	80,000
Playground	20,000
Sportsfield	20,000
Trails development	16,000
Park Centre Bldg.	250,000
TOTAL	$1,650,000

SBDA portion (2/3 of $1,650,000) $1,100,000

OTHER RECREATION SITES

Boat launches/parking/washroom facilities	
5 sites at Rafferty x $50,000	$250,000
2 sites at Alameda X $50,000	100,000
#705 wetlands (Rafferty)	90,000
Valley of the Rocks (Rafferty)	150,000
TOTAL	$590,000

RECREATION - Cont'd

DR. MAINPRIZE REGIONAL PARK (excluding land)

Golf course (sand greens)	$ 180,000
Clubhouse	70,000
Equipment	10,000
Swimming Pool	180,000
Mechanical/washrooms, etc.	200,000
Campgrounds/services	200,000
Workshop/storage	40,000
Concession/residence	80,000
Sportsfields, etc.	50,000
Relocate Mainprize facilities	100,000
Infrastructure	250,000
Landscaping/trees, etc.	100,000
Marina/beach/boat launch	60,000
Maintenance (10 yrs.)	200,000
TOTAL	$1,720,000

LUTHERAN CHURCH CAMP

Relocation/Replacement (excluding land)

Purchase of existing facilities — To be determined

Access roads, services, power, phone, water, sewage disposal

OR Replacement of facilities/services (Perhaps move to Alameda)

RAFFERTY

Paved Roads - #18 to #39 (over dam)	$1,466,000
CPR Rail Relocation	571,000
#606 - Causeway & bridge over Souris	2,796,000
Dead Lake Channel #606 (dam)	1,149,000
Gravel Road - Macoun west to #606	275,000
Dead Lake Channel (upstream dam)	696,000
#705 upgrading (over Souris)	516,000
#705 upgrading (over Roughbark)	277,000
Subtotal	$7,746,000
Plus 10% engineering	774,600
Plus 10% contingency	852,060
TOTAL	$9,372,660

ALAMEDA

Grid Road between Twp. 5 & 6	$ 650,000
North/South connecting road (Sec. 31)	110,000
#361 upgrading	1,600,000
North/South connecting road	53,000
Crossing of Shepherd Ravine	740,000
North/South Access Road (past Cochin P.S.)	150,000
East/West Paved access road (over dam) to #9	1,000,000
CPR Rail Relocation	3,500,000
Subtotal	$7,803,000
Plus 10% engineering	780,300
Plus 10% contingency	858,330
TOTAL	$9,441,630

LAND USE

COMMUNITY PASTURES (Rafferty)

	Land Acquisition	Fencing, Dugouts, Etc.	Total
Estevan (PFRA-Cambria)	$ 480,000	$ 60,000	$ 540,000
Midale (SDA)	640,000	100,000	740,000
Lomond #1 (PFRA)	240,000	120,000	360,000
TOTALS	$1,360,000	$280,000	$1,640,000

GEOLOGY & MINERAL RESOURCES

Oil Wells & Related Facilities

Rafferty -	$17,300,000
Alameda -	3,860,000
TOTAL	$21,160,000

FISHERIES

Rafferty -	$ 650,000
Alameda -	350,000
TOTAL	1,000,000

ARCHAEOLOGY

Rafferty & Alameda	$1,300,000

NOTES

1. Environment Canada, Currents of Change, Ottawa, Ontario, September 1985, p. 95; Saskatchewan Environment, Water Management in Saskatchewan, Vol. 1, Summary Report, September 1980, pp. 3-4; A.D. Crerar, "River Basin Management: The Alberta Experience" in Bruce Mitchell and James S. Gardner (eds.), River Basin Management: Canadian Experience, Department of Geography, University of Waterloo, Waterloo, 1983, pp. 270-271.

2. James E. Robinson and Marv Anderson, The Role of Water Demand Management in a Federal Water Policy, Inquiry on Federal Water Policy Research Paper #20, University of Waterloo, Waterloo, June, 1985, p. 2

3. Peter Gossage, Water in Canadian History: An Overview, Inquiry on Federal Water Policy Research Paper #11, University of Quebec, Montreal, March, 1985, p. 117

4. Ibid, p. 92.

5. Ibid, p. 93.

6. Environment Canada, op. cit., p. 18.

7. R.L. Pentland, "A Federal Perspective on River Basin Management" in River Basin Management: Canadian Experiences, B. Mitchell & J.S. Gardner (eds.), Department of Geography, University of Waterloo, Waterloo, 1983. p. 73

8. Environment Canada, op. cit., p. 8.

9. Saskatchewan Environment, op. cit., Volume 3, p. C4

10. Reiner Jaakson, "Riparian Land Management in Saskatchewan and Ontario," in Bruce Mitchell (ed.), Institutional Arrangements for Water Management: Canadian Experiences, University of Waterloo, Waterloo, 1975, pp. 178-181.

11. Saskatchewan Environment, op. cit., Volume 7, p. J4.

12. Ibid., Volume 1, pp. i-xiii.

13. Ibid., p. 7.

14. Ibid., p. 7.

15. See an act to incorporate the Saskatchewan Water Corporation, Assented to May 25, 1984.

16. This commission is a permanent body established under the Boundary Waters Treaty of 1909, consisting of six commissioners, three Canadian and three American, with Canadian and American co-chairmen.

17. Harold D. Hafterson, "Losses in Reservoirs" in Reservoirs: Problems and Conflicts, Oregon State University, Corvallis, Oregon, January 1969, pp. 39.

18. Full Supply Level is defined as the maximum elevation that the reservoir pool is allowed to attain when operations are not directed at achieving flood control benefits.

19. Vernon L. Hains, "The Roche Percee-Pinto Area, Souris River Valley: A Centre of Provincially Rare Plants," in Blue Jay, June 1987, pp. 74-82.

20. Jack C. Stabler, Post Irrigation Assessment, Report prepared for Saskatchewan Water Corporation, January 1987.

BIBLIOGRAPHY

Adam, Christopher I.G., The Birds of the Souris River Valley, Saskatchewan - 1987. Prepared for Environmental Management Associates. October 1987.

Alberta Environment, Oldman River Basin - Report and Recommendations. August 1979.

Bolstad, W., B. Mathur and H. MacKnight "A Case Study of Rural Opposition toward River Valley Planning" in River Basin Management: Canadian Experiences. Bruce Mitchell & James S. Gardner (eds.) Department of Geography Publication Series No. 20 University of Waterloo, 1983. pp. 253-265.

Canadian Environmental Law Research Foundation, Environmental Rights in Canada. John Swaigen (ed.) Butterworths, Toronto. 1981.

Crerar, A.D., "River Basin Management: The Alberta Experience" in River Basin Management: Canadian Experiences. Bruce Mitchell & James S. Gardner (eds.) Department of Geography Publication Series No. 20 University of Waterloo, 1983. pp. 269-277.

Day, J.C., Canadian Interbasin Diversions. Inquiry on Federal Water Policy Research Paper #6. March 1985.

Edmond, D. Paul, Environmental Assessment Law in Canada. Edmond-Montgomery Limited, Toronto. 1978.

EMA Environmental Management Associates (SASK) Ltd., Late Summer/Fall Fisheries Investigations of the Souris River Basin in Saskatchewan and Preliminary Assessment of the Proposed Water Management Program. Prepared for Souris Basin Development Authority. Preliminary Draft November 1987.

------, Vegetation Resources of the Proposed Alameda Reservoir (Moose Mountain Creek) with Special Emphasis on Rare Plants. Prepared for Souris Basin Development Authority. Preliminary Draft November 1987.

Environment Canada, Inquiry on Federal Water Policy - Water is a Mainstream Issue, Participation Paper. 1984.

------, Inquiry on Federal Water Policy - Hearing About Water. April 1985.

------, Inquiry on Federal Water Policy - Final Report - Currents of Change. September 1985.

------, Federal Water Policy. November 1987.

Gossage, Peter, Water in Canadian History: An Overview. Inquiry on Federal Water Policy Research Paper #11. March 1985.

Hare, F. Kenneth, The Impact of Human Activities on Water in Canada. Inquiry on Federal Water Policy Research Paper #2. November 1985.

International Joint Commission, Report on the Souris River Investigation. Ottawa-Washington 1940. Edmond Cloutier, Printer to the King's Most Excellent Majesty 1941.

------, Report of the International Joint Commission to the Governments of the United States and Canada on the Souris River, with Special Reference to the Interim Measures Recommended in its Report of 2 October, 1940. Ottawa-Washington, 19 March 1958.

Jaakson, Reiner, "Riparian Land Management in Saskatchewan and Ontario" in Institutional Arrangements for Water Management: Canadian Experiences. Bruce Mitchell (ed.) Department of Geography Publication Series No. 5 University of Waterloo, 1975. pp. 173-207.

Mitchell, Bruce and Edward McBean, Water Resources Research in Canada: Issues and Opportunities. Inquiry on Federal Water Policy Research Paper #16. April 1985

Maurer, K.F., Public Participation in Environmental Assessment Hearings: An Analysis of Current Practice in Canada and the United States with Proposed Options for the Ontario Environmental Assessment Board. Institute for Environmental Studies, University of Toronto, 1979. Pub. No. EE-11

Muller, R. Andrew, The Socioeconomic Value of Water in Canada. Inquiry on Federal Water Policy Research Paper #5. March 1985.

Ontario Environment, Water Management. May 1984.

Primus, C.L., "River Basin Planning in Alberta: Current Status - Future Issues" in River Basin Management: Canadian Experiences. Bruce Mitchell & James S. Gardner (eds.) Department of Geography Publication Series No. 20 University of Waterloo, 1983. pp. 43-46

Robinson, James E. and Marv Anderson, The Role of Water Demand Management in a Federal Water Policy. Inquiry on Federal Water Policy Research Paper #20. June 1985.

Saskatchewan Agriculture, Brief filed by E.J. Scammell, Chief Engineer, Water Rights Division. Souris River Reference before International Joint Commission Hearing. September 17, 1955.

Saskatchewan Department of Natural Resources, Provincial Master Plan, Meadow Lake Provincial Park, Volume IV. Transcript of Public Hearing in Saskatoon. February 2-3, 1973.

Saskatchewan Environment, Qu'Appelle Basin Study Report. March 1971.

------, Rapid River Report and Recommendations. September 198C

------, Water Management in Saskatchewan - Summary Report, Vol. 1; Terms of Reference Water Legislation, Vol. 2; Water Control and Storage Works, Vol. 3; The Qu'Appelle River System - The Saskatchewan River System, Vol. 4; Water Supply Programs, Vol. 5; Flood Related Programs - Interjurisdictional Water Management - Other Water Resource Matters, Vol. 6; Water Resources Responsibilities, Vol. 7. Hydrology Branch. September 1980.

Saskatchewan-Nelson Basin Board, Water Supply for the Saskatchewan-Nelson Basin. July 1972.

Schwass, R.D., Public Information and Public Participation in Water Resources Policy. Inquiry on Federal Water Policy Research Paper #10. March 1985.

Souris Basin Development Authority, Environmental Impact Statement for Rafferty-Alameda Project. Executive Summary Report, Chapters 1 - 17 and Bibliography. 1987

Souris River Basin Study Board, Souris River Basin Study Report. June 1978.

Stabler, Jack C., Post Irrigation Assessment. Report Prepared for Saskatchewan Water Corporation. January 1987.

Tate, Donald M., Alternative Futures of Canadian Water Use, 1981-2011. Inquiry on Federal Water Policy Research Paper #17. May 1985.

U.S. Army Corps of Engineers, Souris River Basin Project: General Plan Report and Draft Environmental Impact Statement. November 1987.

Wilson, Alice M., "Fighting Floods on the Souris". Western People. pp. 8-10. January 29, 1987.

Young, D.A. and L. Ludwig, Wildlife Investigations Pertaining to the Proposed Rafferty Reservoir During Spring - Fall, 1987. Prepared for The Souris Basin Development Authority. Preliminary Draft November 1987.

------, Wildlife Investigations Pertaining to the Proposed Alameda Reservoir During Spring - Fall, 1987. Prepared for The Souris Basin Development Authority. Preliminary Draft November 1987.

APPENDIX 1

SASKATCHEWAN ENVIRONMENT AND PUBLIC SAFETY

TECHNICAL REVIEW COMMENTS

RAFFERTY/ALAMEDA

ENVIRONMENTAL IMPACT STATEMENT

(EIS)

REVIEW COMMENTS

Saskatchewan Environment

and Public Safety

August, 1987

1. INTRODUCTION

The comments presented in this document are the result of a careful review of the Rafferty/Alameda Environmental Impact Statement submitted to Saskatchewan Environment and Public Safety by the Souris Basin Development Authority. The review was conducted by members of the Environmental Assessment Review Panel and Saskatchewan Environment and Public Safety staff.

The EIS was examined for its technical accuracy, completeness, soundness of impact predictions and adequacy of mitigation proposals. Although comments were received from a wide variety of government departments and agencies, the conclusions and recommendations are those of Saskatchewan Environment and Public Safety.

2. OVERVIEW

2.1 The EIS has, on the whole, adequately identified the potential environmental and economic impacts of the proposed Rafferty dam and reservoir. Furthermore, the EIS has identified mitigation plans which are focussed on the predicted impacts. The mitigation plans, if carried out, will be generally

adequate. The EIS indicates commitment to these mitigation plans.

2.2 Deficiencies in the EIS are:

a) insufficient data from the area of the proposed Alameda reservoir and from the Souris River downstream from the proposed Rafferty reservoir to address the impacts at these locations adequately and to tie them to long-term impacts;

b) insufficient attention to preparing an integrated water management plan, which will take reservoir operating plans, ecosystem management and human water supply demands and flood control requirements into consideration, further tied to an overall mitigation plan. However the proponent has identified missing data sources and made commitments to filling these gaps, principally in the Alameda area and the Souris River below the proposed Rafferty dam.

2.3 Developments in the Souris Basin are subject to existing international apportionment and management arrangements administered by Canada and the United States under the Boundary Waters Treaty, and licensing requirements

under the International River Improvements Act. The conditions of the IRIA licence will require information on the project and operating plan. In particular, details will be required on the effect of the project on water levels, flows and quality at the international boundary.

2.4 The proponent is committed to the expenditure of large amounts of money for mitigation, habitat enhancement, resource management, etc. The proponent is commended for this.

3. DEVELOPMENT AND OPERATIONAL DETAILS

The description of the nature and extent of the development is clear and well illustrated. However, the timing and operation of the development is dependent upon a variety of events occurring in the desired sequence and at critical times. One such event is finalization of the apportionment agreement with the United States; another is Ministerial approval of the proposed Shand generating plant.

The proponent has developed an operational plan which outlines the expected sequence and identifies means of dealing with contingencies.

4. SOCIO-ECONOMIC CONSIDERATIONS

4.1 The economic benefits which the projects are likely to provide the local areas are substantial and long-term. These benefits include those related directly to local business and those which will be obtained directly provided increased recreational and tourism opportunities and irrigation are realized.

4.2 Provided proposed mitigation measures are implemented, the impact on oilfield activities in the project areas will be minor, but estimated costs of that mitigation will be substantial.

4.3 Rates of fill and fluctuations of water levels, both annually and cumulatively, are properly recognized as subject to variances in precipitation - an unknown quantity. It should be more clearly acknowledged that this "unknown", if carried to the worst case scenario, could affect negatively the reservoir's attractiveness for water-based recreation and the availability of water for irrigation. The proponent has acknowledged that there will be fluctuations in the

reservoir water levels, resulting in aesthetic implications.

5. WATER QUALITY

5.1 The model for post-development water quality predictions is appropriate and realistic.

5.2 The EIS indicates that elevated ammonia levels will occur in the reservoir. Implications to the living systems, during periods of bottom water oxygen deficits, may be severe at times.

5.2 The water quality impact assessment was well prepared and the data base was thoroughly considered. The model for post-development water quality predictions is appropriate and realistic.

5.3 Control of treated sewage discharges from Weyburn and Estevan was considered as a potential mitigation measure. It is our understanding that in the case of Estevan, recycling of such discharge through the proposed Shand power station will occur. For Weyburn, it was predicted that effluent removal would reduce peak nutrient concentrations in Rafferty Reservoir but would not change the overall eutrophic status of the reservoir. The proponent indicates that

monitoring will take place to assess the effects of the effluent on the reservoir. There are about 13 other communities that currently discharge sewage into the river or into ponds which could drain into it. We agree with the EIS that the potential water quality impacts of these discharges likely would be small.

5.4 The soils in the study area are well characterized with regard to physical and, to a lesser extent, chemical features. However, their impact on the reservoirs' water quality should be considered to a greater extent.

5.5 Several of the oil wells in the Weyburn Unit will be elevated rather than directionally redrilled and, as a result, will be located very close to the reservoir at full supply level. In view of the uncertainty of the reservoir fill time and the expected fluctuations in water levels, these wells will increase the risk of spills into the reservoir.

5.6 The anticipated water management regime in the potentially affected area is addressed only in very general terms. The impacts of pollutants, siltation, irrigation runoff and

altered temperature and seasonal regimes on the aquatic ecosystems need to be addressed more thoroughly.

6. FISH AND WILDLIFE

6.1 The data presented adequately cover:

a) a wide range of river and tributary habitats with which a variety of fish species are associated;

b) predicted impacts on these habitats and fish from the Rafferty dam development;

c) suggested mitigation measures; and

d) fishery development opportunities.

6.2 Data from the proposed Alameda reservoir and from the Souris River downstream from the proposed Rafferty dam are incomplete. However, the proponent indicates commitment to obtain further information.

6.3 The projects will reduce habitat for deer and for sharp-tailed grouse. Funds have been identified to create new habitat. In addition, the projects likely will create significant new staging areas for waterfowl, providing added tourism and recreation potential.

6.4 The proponent has recognized the major wildlife significance of the project areas and the proposed development. More data are required to document the magnitude of wildlife populations associated with the valleys, and the probable impact of the developments on them. As well, more information is needed on rare and endangered species and on furbearers. It is acknowledged that the proponent is seeking such information from additional studies in the Alameda area and the Souris River valley downstream from Estevan.

6.5 Water management plans for important nearby wetlands should be included in the "plan of operation" for the projects and in any related documents.

6.6 Use of Habitat Evaluation Procedures (HEP) for analyzing wildlife impacts in the proposed Alameda reservoir, and in the Souris River valley downstream from Estevan, should obviate most concerns about assessing the impacts of the developments on these areas. The HEP analysis has been shown to be quick, efficient and reasonably accurate, and it will strengthen the existing impact statement.

6.7 The mitigation proposals put forward are ecologically sound and have considerable fiscal resources dedicated to them. There is no doubt that their implementation will ameliorate the impact of the Rafferty development. However, the lack of detailed knowledge of the habitats and the wildlife populations makes it unclear whether these measures will result in "little net loss" of habitat for these species. The additional data collection which the proponent is prepared to do will enable more detailed assessments of the mitigation's effectiveness.

7. AGRICULTURE AND LAND USE

7.1 The EIS recognizes that the amount of irrigable land near the reservoirs which could be developed economically is relatively small. Furthermore, there is no assurance that sufficient water will be reliably available to irrigate all of the land which could be potentially available for irrigation.

7.2 The report assumes that irrigation will be realized on 2-3 times the number of acres as are currently projected for irrigation within any of the individual areas being developed

under the Canada-Saskatchewan ERDA Irrigation Sub-Agreement. There is a difficulty in promoting the Souris Basin project on the basis of the benefits that irrigation will have on the economy of the region, lacking discussion of the ways in which, and the extent to which, irrigation in the area can reasonably be implemented.

7.3 The proposed projects will result in loss of agricultural land, but may promote increased productivity on some lands following implementation of irrigation. Both economic and productivity benefits and losses will be realized.

8. ARCHAEOLOGY

8.1 It is clear the proposed project areas contain numerous heritage resources, several of which are highly significant to understanding the prehistory and early history of the Souris Basin and southeastern Saskatchewan. The construction of the Rafferty and Alameda dams will disturb and destroy many of the archaeological sites thus far located in the proposed impoundments. However, the losses of heritage resources can be mitigated by an

appropriate impact management program. The Souris Basin Development Authority has proposed such a program.

8.2 The impact management program proposed on pages 49 to 52 is regarded as sufficient to mitigate the majority of predicted impacts. However, the possibility remains that highly significant or sensitive resource types (e.g., prehistoric agricultural settlements, burials) may be encountered which could require special measures above and beyond those proposed in the impact management program. This possibility has been anticipated in the Heritage Resource Impact Management program General Terms of Reference.

8.3 The heritage resources component was clearly identified within the project, and appropriate investigations are and continue to be carried out. The impacts have been spelled out, and the mitigative plans developed appear appropriate and, as far as can be determined, adequate. The consultation between the Souris River Basin Authority and Saskatchewan Parks, Recreation and Culture should provide for ongoing address to issues as they arise in the course of continuing investigations.

8.4 Contingency provisions should be made available for archaeological mitigation. Such contingency operations may be required:

a) during regular mitigation activities if unusually significant materials are discovered which require extensive site excavation;

b) during construction, when buried sites not normally noted during surface surveys may become exposed; and

c) during reservoir operation, when wave action at newly created shorelines may expose significant materials and sites.

APPENDIX 2

MINISTER'S ORDER & RELATED SCHEDULES

MINISTER'S ORDER

I, H.J. Swan, Minister of Environment and Public Safety, do hereby make the following order pursuant to section 14 of The Environmental Assessment Act:

1. That the Rafferty-Alameda Board of Inquiry be appointed consisting of the following members:

   (a) Dr. John Brennan, Chairman — Dean, College of Commerce, University of Saskatchewan, Saskatoon

   (b) Ms. Darla Hunter, — Barrister and Solicitor, MacPherson, Leslie & Tyerman Regina, Saskatchewan

   (c) Mr. Clarence Fleck, — Farmer, Lampman, Saskatchewan

2. That the terms of reference of The Rafferty-Alameda Board of Inquiry be as follows:

   THE BOARD SHALL:

   (a) review information on the project including available environmental studies;

   (b) facilitate the provision of information to the public;

   (c) receive public comment on any matter related to the proposed development, including the social, economic, and environmental implications;

   (d) make recommendations based on its review of the project and the public comments as to the adequacy of the plans for mitigation of known or potential social, economic, and environmental effects of the project;

   (e) make recommendations to the Minister of Environment and Public Safety whether the project should proceed, should not proceed, or proceed subject to specified conditions;

   IN CONDUCTING THE INQUIRY, THE BOARD:

   (f) will organize and conduct informal public meetings in such places in Saskatchewan as the Board believes necessary to allow the public a reasonable opportunity to present their views on the project;

(g) will receive briefs, both written and oral, from individuals and organizations;

(h) will arrange for the proceedings of the meetings to be recorded and transcribed;

(i) will prepare a report of its findings and recommendations; and

(j) forward its report and a transcript of the proceedings of the public meetings to the Minister of Environment and Public Safety.

3. That the Payment of Honoraria and Expenses for the Rafferty-Alameda Board of Inquiry be as follows:

HONORARIA:

Chairman:	Dr. John Brennan - $300.00 per day)	for each day
Member:	Ms. Darla Hunter - $300.00 per day)	or part
	Mr. Clarence Fleck-$300.00 per day)	thereof while engaged in activities associated with the work of the Board of Inquiry.

EXPENSES:

All expenses for actual and reasonable travel, sustenance and accommodation expenses incurred while engaged in activities associated with the work of the Board of Inquiry.

Signed this 27th day of July, 1987, at Regina, Saskatchewan.

Honourable H.J. Swan
Minister of Environment and Public Safety
Government of Saskatchewan

A P P E N D I X 3

NOTICE OF PUBLIC INFORMATION MEETINGS

AND SELECTED PRINT

Public Meetings

The Rafferty-Alameda Board of Inquiry will be holding meetings for the purpose of receiving public comment on the proposed Rafferty and Alameda dams.

In preparation for these meetings the Board of Inquiry has requested the Souris Basin Development Authority, the proponent of the project, to conduct public information meetings in the following locations:

Weyburn:	August 17, 2 - 5 p.m. Weyburn Inn
Carlyle:	August 17, 7 - 10 p.m. Falco Place
Oxbow:	August 18, 2 - 5 p.m. Bow Manor Motor Hotel
Estevan:	August 18, 7 - 10 p.m. Beefeater Motor Inn

All interested groups and individuals are encouraged to attend.

For more information contact the Board of Inquiry office at 787-5378, or write:

Rafferty-Alameda Board of Inquiry
2nd Floor, West Wing
T.C. Douglas Building,
3475 Albert Street
Regina, Saskatchewan
S4S 6X6

SELECTED PRINT

Regina Leader Post

Indian Head-Wolsley News

Grenfell Sun

Whitewood Herald

Moosomin World Spectator

Kipling Citizen

Carlyle Observer

Carlyle Prairie Progress

Redvers Optimist

Oxbow Herald

Carnduff Gazette Post News

Estevan Mercury

Weyburn Review

Radville Star

A P P E N D I X 4

ATTENDANCE AT INFORMATION MEETINGS

PUBLIC INFORMATION MEETINGS

DATE	LOCATION	APPROXIMATE ATTENDANCE
August 17	Weyburn	42
August 17	Carlyle	31
August 18	Oxbow	62
August 18	Estevan	88

Notice of Public Meetings on the Rafferty and Alameda Dams

The Souris Basin Development Authority has made public the site of the proposed Alameda dam. The dam will be located at SECTIONS 32 and 33, TWP 3, RGE 2, W2M.

In order to ensure the public an opportunity to express its views on the project now that the final site location has been chosen, the Rafferty-Alameda Board of Inquiry will hold an additional meeting to receive public submissions on any aspect of the proposed Rafferty and Alameda dams.

The meeting will be held in Alameda, Saskatchewan, at the Legion Hall from 1:00 to 5:00 p.m. on November 13, 1987.

All interested groups and individuals are encouraged to attend.

For more information please contact the Board of Inquiry office at 787-5378.

SELECTED PRINT

Regina Leader Post

Indian Head-Wolsley News

Grenfell Sun

Whitewood Herald

Moosomin World Spectator

Kipling Citizen

Carlyle Observer

Carlyle Prairie Progress

Redvers Optimist

Oxbow Herald

Carnduff Gazette Post News

Estevan Mercury

Weyburn Review

Radville Star

A P P E N D I X 5

NOTICE OF PUBLIC MEETINGS

AND SELECTED PRINT

A P P E N D I X 6

ATTENDANCE AT PUBLIC MEETINGS

APPROXIMATE ATTENDANCE

CARLYLE - Skyline Motor Inn		
	September 9	Afternoon - 28 Evening - 40
OXBOW - Bow Manor Motor Hotel		
	September 10	Afternoon - 70 Evening - 110
WEYBURN - Weyburn Inn		
	September 11	Afternoon - 50 Evening - 50
	September 12	Morning - 40 Afternoon - 55
ESTEVAN - Beefeater Inn		
	September 17	Afternoon - 35 Evening - 70
	September 18	Afternoon - 50 Evening - 65
	September 19	Morning - 25 Afternoon - 25
REGINA - Landmark Inn		
	September 21	Afternoon - 120 Evening - 120

APPENDIX 7

INDIVIDUALS/ORGANIZATIONS HEARD AT PUBLIC MEETINGS

CARLYLE - September 9/87

Organization	Presenter
Food First, A Coalition of Agricultural Land Users	Mr. Bob Linnell
Town of Melita, Manitoba	Mayor Ken Carels
Self	Mr. Robert Hume
Self	Mr. J.P. Harvey
Self	Mr. John Brown
Self	Mr. Ernest Richter
Self	Mr. John Wilbraham
Self	Mr. Harold Madsen
Self	Mr. Erik Steffensen
Self	Mr. Tom Weatherald
Self	Mr. Howard Young
Self	Mr. Bill Ireland
Self	Mr. Ken Humphries
Self	Mrs. Lila McNeil
Self	Reverend Keith Lyons
Self	Mr. Don McNeil
Self	Mr. Harold Tetzlaff
Self	Mr. Lew Oatway
Self	Ms. Judy Swallow
Self	Ms. Mae Hume
Self	Mr. Jack McLean
Self	Mr. Ed Dunkerley
Self	Ms. Anita Thornton
Self	Mr. Cliff Walker

OXBOW - September 10

Organization	Presenter
Souris River Joint Water Resource Board	Mr. Glen Wunderlich
Self	Mr. John Deadlock
The Support Group of Oxbow	Mr. Alan Shay
Self	Mr. George Stevens
Self	Mr. Don Griffin
Self	Mr. Tony Sereggela
Self	Mr. Kip Dixon
Self	Mr. Nels Neilson
Self	Mrs. Doreen Bachorcik
Self	Mr. Emile Lalonde
Saskatchewan Environmental Review Committee for the Rafferty/ Alameda Project	Mr. Ron Renwick
Self	Mr. Jim Cobham
Self	Mr. Ken Mayhem
Self	Mr. Don McLean
Town of Alameda	Mr. Glen Davis
Saskatchewan Archaeological Society Regional Representative	Mr. Mike Bartolf
Self	Mr. John McNeil
Self	Mr. Doug Sim
Self	Mr. Glenn Swallow
Self	Mr. Sean Brennan
Self	Mr. Doug Southam
Self	Mr. Terry Deyell
Self	Mr. Tony Moser

WEYBURN - September 11

Organization	Presenter
City of Weyburn	Mayor William Shields
Self	Tom Quigley
Self	Reverend Ross McMurtry
Self	Mr. D. Robert McClinton
Self	Mr. Ian Budding
Community Development Committee of Weyburn	Mr. Sandy Sanderson
Saskatchewan Wildlife Federation (Weyburn Branch) - and - Western Outlander Television Program	Mr. Lorne Onstad
Souris Conservation and Development Authority	Mr. Ernie Richter
Self	Mr. Merv Murray
Self	Mr. Gerald Fichtemann
Self	Ms. Gwen Garner-Trout

WEYBURN - September 12

Organization	Presenter
Lomond Municipality	Mr. John McKenzie
Lomond #1 P.F.R.A. (Weyburn)	Mr. Mervin Freeman
Self	Ms. Ruby Hood
Self	Mr. Raymond Churchill
Self	Mrs. Joyce Muirhead
Self	Mr. Don Wilkinson

WEYBURN - Sept. 12 (Cont'd)

Souris Valley Land Users' Association	Mr. Norman Alexander & Mr. Don Wilkinson
Self	Mr. Bill White
Self	Mr. Barry Farr
Self	Mr. Michael Bishop
Self	Mr. Al Yeaman
Self	Mr. Al Watson
Self	Mr. Lorne Scott
Self	Mr. Murray McGuiness

ESTEVAN - September 17

Organization	Presenter
R.M. of Estevan No. 5	Mr. Dale Malmgren
Self	Mrs. Lois Shipman
Saskatchewan Wildlife Federation (Estevan Branch)	Mr. Clayton Toner & Mr. Harvey Hackney
Self	Mr. Everett Murphy
Self	Mr. Don Hahn
Self	Mr. Orlin Oium
Self	Mr. Jim Downey
Hay Plot Leaseholders, Midale	Ms. Alma Hoium
Self	Mr. Ed Appenheimer
CJSL Radio	Mr. John Empey
Self	Mr. Glenn Coles
Self	Mr. Paul Bachorcik
Self	Mr. Shaun Harrison

ESTEVAN - Sept. 17 (Cont'd)

Self	Ms. Lillian Wanner
Estevan National Exhibition Centre	Ms. Jeanne Perry & Ms. Ethelwyn Dzuba
City of Estevan	Mayor Bernie Collins
Woodlawn Regional Park Authority	Mr. George Gelmich
Woodlawn Golf Club Inc.	Mr. Bob Cochrane
Estevan Lions Club	Mr. Bill Goodmanson
Saskatchewan Archaeological Society	Mr. Roy McKague
River Bend Nursery	Mr. Gerald Fichtemann
Self	Mr. Ken Czoba

ESTEVAN - September 18

Organization	Presenter
Estevan Mercury	Mr. Peter Ng & Mr. Norm Park
Self	Mr. Cameron Muir
City of Minot, North Dakota	Mayor George Christensen
Self	Mr. Orlin Backes
Self	Mr. Richard Backes
Minot Chamber of Commerce	Ms. Karen Krebsbach
Minot Convention and Visitors Bureau	Mr. Blake Krabseth
Village of Torquay	Mr. Carl Graefer
Estevan Public School Board	Mr. Ron Gallaway
Self	Mr. Mark Walliser
Self	Mr. Gilles Guenette
Self	Mr. George Green

ESTEVAN - Sept. 18 (Cont'd)

Self	Mr. Rueben Swenson
Citizens United to Save the Valleys	Mr. Orlin Hanson
Self	Mr. Lloyd Nygard
Self	Senator Bruce Bakewell State of North Dakota
Midale Community Pasture Advisory Board	Mr. Norm Eggum
Town of Oxbow	Mr. Alan Shay
Self	Ms. Olive Hanson
R.M. of Cambria	Mr. Robert Hurren

ESTEVAN - September 19

Organization	Presenter
Renville County Board of Commissioners	Mr. Ken Shobe
Self	Mr. Bill Mitchell
Self	Ms. Alice Pawson
Town of Lampman	Mayor Earle Kickley
Self	Mr. Gordon Geske
Self	Mr. Jack Muirhead
United Mine Workers of America	Mr. Roy Ludwig
Estevan Downtown Business Association	Mr. Len Grube
Self	Mr. Brad Dutton
Self	Mr. Kelly Panteluk
Families Living in the Souris Valley, North Dakota	Ms. Ruth Stanley
Business Improvement District for Estevan's Downtown Business Core	Mr. Frank John

ESTEVAN - Sept. 19 (Cont'd)

Self	Mr. Richard Johnson
Self	Mr. Ralph Olney
Cossette Brother's Dairy Farm	Mr. Bob Cossette
Self	Professor Joe Dolecki
Estevan Exhibition Association	Mr. Bill Owens
Hitchcock Water Users Association No. 62	Ms. Joyce Muirhead

REGINA - September 21

Organization	Presenter
Friends of the Valley	Dr. Gerry McKinney
Estevan Chamber of Commerce	Mr. John Empey
Self	Mr. Vernon McLean
IPSCO, Inc.	Ms. Anne Parker
Saskatchewan Natural History Society	Mr. Bob Ewart
Ducks Unlimited	Mr. Tim Thiele
Saskatchewan Environmental Society	Mr. Bert Weichel
Self	Mr. Bob McCuaig
Saskatchewan Wildlife Federation	Mr. Ed Begin
Self	Mr. Bob Lyons, M.L.A.
Self	Mr. Doug Elsasser
Citizens Concerned About Free Trade	Mr. David Orchard
Self	Mr. Al Taylor
Self	Mr. Frank John

REGINA - Sept. 21 (Cont'd)

North Dakota State Legislative Assembly	Mr. Orlin Hanson
Self	Mr. Vern Fahy
Souris Basin Support Association	Mr. Jack Muirhead
The Sierra Club, Saskatchewan	Ms. Catherine Christie
Self	Mr. Bruce Allison
Self	Mr. Lester Heintzman

A P P E N D I X 8

NOTICE OF PUBLIC MEETING IN ALAMEDA

Notice of Public Meetings on the Rafferty and Alameda Dams

Public meetings will be held by the Rafferty-Alameda Board of Inquiry to consider public submissions concerning the proposed dams. Following the presentation of briefs, the public will have the opportunity to present their views.

If you wish to participate in the meetings by presenting a brief or submission, please contact the Board to enable scheduling. Written briefs may also be submitted at any time before October 31 to:

The Rafferty-Alameda Board of Inquiry
2nd Floor, West Wing
T.C. Douglas Building
3475 Albert Street
Regina, Saskatchewan S4S 6X6

Meetings will be held:

Carlyle:	September 9, 2 to 5 p.m. and 7 to 10 p.m., Skyline Motor Inn
Oxbow:	September 10, 2 to 5 p.m. and 7 to 10 p.m., Bow Manor Motor Hotel
Weyburn:	September 11, 2 to 5 p.m. and 7 to 10 p.m., Weyburn Inn
	September 12, 9 to 12 a.m. and 1 to 4 p.m., Weyburn Inn
Estevan:	September 17 & 18, 2 to 5 p.m. and 7 to 10 p.m., Beefeater Motor Inn
	September 19, 9 to 12 a.m. and 1 to 4 p.m., Beefeater Motor Inn
Regina:	September 21, 2 to 5 p.m. and 7 to 10 p.m., Landmark Inn

All interested groups and individuals are encouraged to attend.

For more information please contact the Board of Inquiry office at 787-5378.

Selected Print

Regina Leader Post
Saskatoon Star Phoenix
Prince Albert Daily Herald
Moose Jaw Times Herald
Indian Head-Wolseley News
Grenfell Sun
Whitewood Herald
Moosomin World Spectator
Kipling Citizen
Carlyle Observer
Carlyle Prairie Progress
Redvers Optimist
Oxbow Herald
Carnduff Gazette Post News
Estevan Mercury
Weyburn Review
Radville Star
Lloydminster Times
Melfort Journal
Melville Advance
N.B. News Optimist
Swift Current Sun
Yorkton Enterprise
Flin Flon Reminder

APPENDIX 9

INDIVIDUALS/ORGANIZATIONS HEARD

AT PUBLIC MEETING IN ALAMEDA

ALAMEDA - November 13, 1987

Organization	Presenter
Self	Judy Swallow
Self	John McNeil
Alameda Auction Mart Ltd.	Paul Ripley & John Wilbraham
Self	Lila McNeil
Self	John Wilbraham
Saskatchewan Archeological Society	Eldon Johnson
Self	Harold Tetzlaff
Self	Helen Finucane John Brown
Self	Herb Lapp
Self	Newton Reid
Self	Orlin Hanson
Self	Glenn Swallow
Self	Marilyn Freitag
Self	Ed Tetzlaff
R.M. of Moose Creek	George Stevens
Self	Neil Drader
Self	Hazel Paton
Self	Jack Muirhead
Self	Don McLean

A P P E N D I X 10

LIST OF WRITTTEN BRIEFS RECEIVED

BY BOARD OF INQUIRY

WRITTEN SUBMISSIONS

Joe Abello
Lewvan, Saskatchewan

Doreen Bachorcik
Estevan, Saskatchewan

Verna Cobham
Alameda, Saskatchewan

B. Thomas East
Alameda, Saskatchewan

Gwen East
Alameda, Saskatchewan

Mary Gilliland
Saskatoon, Saskatchewan

John Coffin, President
Happy Hookers Fishing Club
Minot, North Dakota

Ed Kennett
Parkman, Saskatchewan

G.F. Ledingham
Regina, Saskatchewan

P.M. Bowman
Vice President & General Manager
Manitoba & Saskatchewan
Coal (1984) Ltd.
Bienfait Coal Co. Ltd.
Luscar Ltd.
Estevan, Saskatchewan

Ardell Kuchinka
Secretary-Treasurer
Dr. Mainprize Regional
Park Authority
Macoun, Saskatchewan

D. Glays, Executive Director
Manitoba Wildlife Federation
Winnipeg, Manitoba

Donald McLean
Alameda, Saskatchewan

David C. Campbell
Resources Economist
Water Resources Program
National Wildlife Federation
Washington, D.C.

Bob Lyons, Environment Critic
New Democratic Party Caucus
Regina, Saskatchewan

Duane Anderson, President
North Dakota Wildlife Federation, Inc.
Bismarck, North Dakota

Lynn Baerwald, President
Oxbow Business Association
Oxbow, Saskatchewan

K.R. Parham, Chief Production Engineer
Production Operations Department
PanCanadian Petroleum Ltd.
Calgary, Alberta

Wm. H. Long, President
Regina Archaeological Soiety
Regina, Saskatchewan

R.G. Bundon, President
Saskatchewan Chamber of Commerce
Regina, Saskatchewan

Saskatchewan Federation of Labour
Regina, Saskatchewan

M.H.F. Hey, Conservation Director
& J.A. Slimmon, President
Saskatoon Natural History Society
Saskatoon, Saskatchewan

Gordon Tenold
Estevan, Saskatchewan

John L. Spinks
Deputy Regional Director
U. S. Department of the Interior
Fish and Wildlife Service
Denver, Colorado

D. Bobbitt, President
Weyburn Natural History Society
Weyburn, Saskatchewan

A P P E N D I X 11

REPORT ON LAND ACQUISITION AT CORONACH

By G. MUMEY for L. BARBER

FACULTY OF BUSINESS ADMINISTRATION AND COMMERCE

Department of Finance and Management Science

Telephone: 432-5693

CENTRAL ACADEMIC BUILDING
THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA
T6G 2G1

22nd April, 1977

Dr. L.I. Barber
President, University of Regina
Mediator on Issues Involving
Saskatchewan Power Corporation
& Poplar River Surface Rights Assoc.

Dear Dr. Barber:

The dispute between the Saskatchewan Power Corporation and the Poplar River Surface Rights Association has focussed on three central issues:

(1) The evaluation of lands which have been or will be taken as the site for a dam and reservoir, coal mining fields, and a transportation corridor.

(2) The additional compensation which should be paid for various disruptions associated with the forced taking of land.

(3) The question of the time when the Saskatchewan Power Corporation shall occupy the affected lands, and of severance allowances for occupancy before the expiration of a specified period.

Ancillary issues relate to the evaluation of buildings and other improvements, compensation for unplanned disposals of livestock, and disruption of farm water supplies.

I offer comment and opinion on these issues based on my experience in farming and economic analysis coupled with personal views about what constitutes fairness. I wish to make clear that I have not researched the legal aspects of the situation.

General Principles

My opinions regarding an approach to the resolution of the issues turn first on the principle that the landowners should be left unaffected economically by the taking of their lands. More specifically they should be provided with the opportunity to reproduce the profitability and convenience of their existing farming operations, which are disturbed by the taking of land by S.P.C., or to be compensated for the extent to which their previous situation cannot be readily reproduced. The same rationale applies with respect to the dislocation of persons from farm residences, and the occupancy of farm buildings and other improvements.

My opinions will also be affected by considerations of economically efficient solutions. I will be concerned with making suggestions which minimize income tax obligations for the affected parties and which avoid other situations which may, from the viewpoint of the two parties to the mediation, be regarded as economic waste.

In addition there is a third objective - to develop solutions that are simple, that are subject to minimal misunderstanding and uncertainty, and that are extensible to future land taking for expansions of mining activity.

Unfortunately, simplicity and generality have a tendency to conflict with equity. Simplification tends toward similarity of treatment for situations which are partially dissimilar. A policy question results: should the terms of simple solutions be made so generous that no individual is left economically undamaged by the taking of land, even though this results in overcompensation for some other landowners. An alternative would place more emphasis on the rights of society, redressing problems of individuals on average, with overcompensations and undercompensations in individual cases approximately equalized. My predilection is

to settle somewhere between these positions, and try to devise general methods of compensation which are more likely to err in the direction of too much compensation for individuals rather than too little, to reflect the respect for individual rights which is part of our social fabric. At the same time however, I must recognise that the S.P.C. cannot responsibly undertake compensations which produce extravagant enrichments for some landowners at the collective expense of the Province's utility users.

An Overall Approach to Settlement

The approach I propose for compensation for the taking of land rests on the concept of replacement valuation in an imperfect land market. It appears that the simplest way to compensate for the disruption of a farming operation through the taking of land is to offer compensation to the landowners based on the cost of replacing the land. Replacement land must lie within a reasonable distance from the taken land and replacement must take place within a reasonable time period. The imposition of these constraints with respect to geography and time creates a sellers' market. Transactions for replacement must be presumed to be initiated by buyers, who are attempting to "force" their way into a market.

I think anyone familiar with farmland transactions realises that a price spread exists, analogous to the difference between "bid" and "ask" quotations in the securities market. One can think of expanding farmland in two ways. A farmer may wait for market opportunities, and expand by taking advantage of someone else's willingness to sell. If the buyer is a sufficiently able negotiator and if the seller is unwilling to search or wait for other bidders, the ingredients of a "bargain" purchase are at hand. On the other hand, when one thinks of the foreign investor who comes in and attempts to assemble a block of land in a given

details of this estimation will be discussed in an ensuing section. If an applicable estimate can be obtained, consider its advantages in the reaching of an equitable settlement.

If farmers can be compensated in such a way that land can be replaced, a major part of the consequences of the taking of their land are ameliorated. A landowner can take the money for replacement, buy comparable land, and continue farming at the same scale as before, in approximately the same location. At the extreme, if it were possible to give a farmer enough to buy land of equivalent quality immediately adjacent to the land that was taken, the problem of farming disruption would basically have been solved. In this perfect and extreme case, it would be difficult to see a basis for offering further compensation for land, including penalties for forced taking and compensation for immediate possession. In other words the compensation problem would turn, with respect to farming operations, on a single issue, valuation of land, rather than the three major issues discussed initially - land valuation, override for forced taking, and potential payment for dispossession.

The situation in reality is not this perfect; absolutely similar replacement land will not be immediately available. But the replacement concept allows attention to be focussed on the central facet of the problem. If compensation can allow replacement with land that is a reasonably close substitute, the compensation problem is reasonably close to a solution.

Particularly with respect to payments for dispossession, the issue seems quite straightforward. If a reasonable approximation of replacement value is paid so a landowner has the opportunity to replace his land, it is difficult to say how the landowner can claim entitlement to the use of the taken land for a protracted

area without devoting a large amount of time to seeking out willing sellers, an "overpriced" land sale is probably in the making.

One can expect the bid and ask spread in farmland to be much greater than that on the securities market. One buys a security out of a security issue, recognising that there are a very large number of identical securities in the issue. A security is readily transportable; through the market arrangements that have evolved, an individual wishing to buy or sell a security can be in touch almost costlessly with thousands of prospective buyers or sellers of a particular security. He also is readily able to make comparisons between security issues, and if he is willing to substitute among a number of security issues he can enlarge the population of prospective buyers and sellers much further.

In contrast, land is much more heterogeneous in character. A history of profitability is not normally available, and land must be bought on the basis of personal inspection. Usually the cost and inconvenience of contacting prospective buyers or sellers is drastically higher than in the case of securities. Therefore one expects that even the most rational of buyers and sellers will settle for a less favourable price in preference to protraction of search. The situation is aggravated if one is purchasing land for operation rather than for investment since, because it is uneconomical to spread farming operations over too large a radius, search must be limited to localised alternatives.

Replacement value of land will obviously be difficult to obtain. Historical information on land sales will provide some indication, but this information will not indicate whether the initiative in the transaction came from the buyer and seller, or the intensity with which the initiative was pursued. However, I believe it is possible to make a reasonable estimate of replacement value; the

period of time or a compensation for occupation of the land before this time. Specifically, I would suggest that replacement value be approached under the assumption that the value must be set high enough so that purchasers can force their way into the market for substitute land within two years. It would then seem reasonable to allow them possession of their existing land for two years with compensation obtaining only in the event that they are dispossessed before expiration of the two year period. This reduces Issue 3 of the issues initially listed from a major to a minor problem.

The question of a compensative override for forced taking also now becomes more tractable. This compensation would derive from imperfections in the potentiality for replacement. These imperfections will arise from uncertainty in the prediction of the cost of replacement land and imperfection in the substitutability of the replacement land for the taken land. The lack of substitutability will arise because it is unrealistic to presume that taken land can be replaced with immediately proximate land or that land of equivalent soil type, topography, weed infestation, or farming practice history can be identified and obtained.

Determination of Replacement Land Value

As noted previously, the accumulation of data on land sales in the region around Coromach provided a starting point for replacement valuation. This data indicates what land buyers and sellers have been willing to pay and accept for land. This information, expressed in the form of ratios of market value to assessment (hereafter called assessment ratios) is highly varied. The reported ratios of land sold without noted valuation effects of buildings range from about 5 up through 25. There are a number of reasons for this wide dispersion:

(a) Relationship between assessment values will not reflect the relation-

ship between market values with perfect accuracy. There has been a tendency to increase assessments upward when reassessment takes place. Reassessment dates vary throughout the land on which sales data have been obtained and this introduces an error dimension. Additionally it is too much to expect that assessments, even at the time they are made, reflect exact productivity relationships.*

(b) Some of the transactions reported will not be truly market transactions. One thinks of a typical land sale as between an older and more affluent seller and a younger less affluent buyer. There is an obvious case of bias introduced when transactions take place in a relationship that is not legally at "arm's length", e.g., between father and son. In a transaction of this type there may be a low price set with a direct intention of making a wealth transfer from the father to the son. Even when the transaction is legally "arm's length" it is consistent with my experience to believe that there will be a certain number of transactions which manifest generousity, as an older landowner "helps out" a favoured younger farmer.

The possibility of some transactions of a non-market character tends to inject a downward bias on land values, and makes some of the very low assessment ratios particularly suspect.

(c) As noted previously, dispersion in land values can be explained by

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*It is interesting to note that erroneous assessment relationships will reflect themselves in higher assessment ratios for land with lower assessments. Land which is under-assessed will tend to have a low assessment value and a high assessment ratio, while land that is over-assessed will tend to the converse. The Coronach area assessment ratios bear out the existence of this assessment error. If land is ranked by assessed value, higher assessment ratios are associated with low assessments. The fact that this results from a statistical bias and not from a relative preference of the land market for low productivity land can be demonstrated by ranking land by selling price rather than by assessment value; in this case assessment ratios display no noticable proportionality, either direct or inverse, to land value.

bid and ask phenomenon where the transaction price is determined by the source of the initiative for the transaction. Closely related to this point, negotiating skill has an effect on some transactions. If there is a range of prices which are acceptable to buyer and seller (e.g., if a buyer is willing to pay $250/acre and the seller is willing to accept $175/acre) determination of the actual price may turn in part on the negotiating skills of the two parties in obtaining information about market alternatives.

Obviously, when one attempts to identify replacement value, which presumes a buyer-initiated transaction, the established land value should lie above the centre of the historical market data. Furthermore, that data may be systematically biased downward by the inclusion of transactions which are legally "arm's length" but which factually may not be "arm's length".

One approach to replacement value determination based on existing market data could proceed as follows: treat the problem of over- and under-assessment as intractable, and treat the bias introduced by transactions of a non-"arm's length" type by excluding the bottom 20% of the population of assessment multipliers. Then divide the remaining 80% into a top-half, presumed to be buyer-originated transactions, and a bottom-half which are presumed to be seller-initiated. Use the data on the top-half (or 40% of the entire accumulated data) as the relevant data for replacement value determination. Such a procedure would yield a multiplier of roughly 19 on average. If this were corrected from a composite of 1975 and 1976 dollars to 1977 dollars through an inflation adjustment the multiplier would rise to about 22. Obviously this is only an example, but I believe it has a suggestive value and is not in gross conflict with reality.

As a more direct approach I decided to ask persons whom I believed might

might be knowledgable about land values in the area for their approximation of replacement value. I specifically asked what an aggressive buyer would have to pay to pick and choose among top quality farmlands in the area and to consummate his transactions with reasonable dispatch. My sources of information included bank managers, credit union managers, farmers who happen to be in grain elevators when I stopped there, elevator managers, and the parties in this mediation. The answers were given in "per acre" figures which must be translated into assessment multipliers.

In response to my question directors of the Poplar River Surface Rights Association gave an answer of $300. per acre; officials of the S.P.C. answered with $200 per acre. Response from other persons, which I had to cull considerably on the basis of apparent knowledgability, gave greater support for the farmers' position. A bank manager at Bengough said that he believed that land could be commanded for $250 per acre in his locale but that the land around Coromach was superior. A credit union manager at Willowbunch, a man who said that he was familiar with the land in question, thought that $300 would be an appropriate figure. Several farmers with whom I talked in Assiniboia ventured that first class land there would sell for over $350. They suggested that the best land at Coronach would be comparable in quality, except for the location next to a regional trading center, which imparted extra value to the land near Assiniboia.

If one interprets top quality land to mean land of the maximum assessed valuation within the area of contemplated acquisition by S.P.C. $1950, the assessment multiplier implied by a price of $300/acre is $48,000/$1,950, or between 24.6. The S.P.C. figure translates to 16. In my view the S.P.C. figure is consistent with the central tendency of all recent market transactions that have been reported by

both parties. Because of the factors which tend to force replacement value upward I believe the S.P.C. figure is too low and that the multiplier of 24.6 implied by the landowners' position is plausible.

Terms of Acquisition

If a replacement value assessment ratio of $48,000/$1,950 or 24.6 is accepted what follows in terms of a total settlement?

To repeat a point made previously it must be recognised that accepting a replacement value ratio of 24.6 will imply that S.P.C. has gone a long distance in compensating farmers for the taking of land. However it will not have gone all the way. Several elements for which some compensation may be expected remain:

(a) The search for replacement land, even when the buyer is willing to pay a high price, will not be frictionless. Some delay can be expected, and some effort will have to go into the search.

(b) It is unreasonable to suppose that land immediately contiguous to existing farming units can be acquired. While the replacement price is high enough to allow the presumption that replacement land can be found reasonably close, I still believe that some adjustment for the cost of farming land which is more remotely located should be included in the settlement.

(c) There may be old mortgages on some of the affected land, with less-than-current interest rates. I might add that these old mortgages are likely to be

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* In my discussion with representatives of S.P.C. reference was made to land that had been advertised for sale in the area. Subsequently a representative of S.P.C. mailed me copies of a number of land advertisements. Since this report was virtually complete at the time I received this information, and since it did not contain information sufficient to assemble assessment ratios, I did not act further upon it.

relatively small in proportion to current land values.

(d) Escalation of land prices above the current estimate of replacement value may occur before replacement transactions can be consummated.

(e) Some of the pastureland along the Poplar River will be difficult to replace even at a favorable assessment multiplier, and will result in some, perhaps permanent, disruption of the mode of operation of some of the affected landowners. Unless they wish to sell out their remaining landholdings and move elsewhere, they will simply not be able to have the type of pasturage that they currently have available.

To compensate for escalation in price of replacement lands before replacement can take place I have recommended that landowners be given the right to use the land which was once theirs, rent-free, for two years after it is bought by S.P.C. This should allow time for the replacement process to be completed. Since S.P.C. will presumably pay for the replacement land at the time of taking, it seems reasonable to assume that interest on the money paid by S.P.C. should roughly compensate for land price rises before replacement.

In addition I propose a payment of $100 per acre to compensate for the other items mentioned above. I am assuming that this is subject to capital gains tax, and that part of that tax can be moderated with an income averaging annuity or with general averaging. Therefore this should amount to approximately $80 per acre after tax. About $30 of this amount, can in the case of grain land be ascribed to the cost of operating at a more remote location (see attachment). The remaining $50 seems reasonable to cover the other items listed above.

In the case where grazing land is involved, the estimated extra cost of farming at a more remote location does not apply. However I am inclined to believe that the disruption of operations for the owners of grazing land is sufficient to

warrant payment comparable to that made on grain land.

Severance Payments

Once S.P.C. acquires land at fair replacement value, and compensates for disruptions, the land unequivocally belong to them. Two years' occupancy is part of the compensation program; occupancy beyond this point ought to be maintainable only on an approximately "arm's length" economic relationship. At that point the land will belong to S.P.C., and while I would urge them to attempt to allow the previous owner to occupy the land at a fair market rental, that decision would be properly made unilaterally by S.P.C.

In the event that S.P.C. wishes to occupy lands prior to the expiration of a two year period I would suggest a rather liberal severance payment. Although I disagree with its propriety when applied over a long period of time, I think there is reasonable justification for using the $36.57/year basis proposed by the Poplar River Surface Rights Association in those instances where S.P.C. has occupied or will occupy lands prior to the expiration of the two year free occupancy period.

The Transportation Corridor

Acquisition of land for the transportation corridor appears to have the potential of considerable disruption in farming activity. Accordingly I would suggest that an equitable solution would lie in the acquisition of whole quarter sections for the corridor's right of way on the same basis as that previously discussed for land taken by S.P.C. I am inclined to believe that a reasonable compensation for disruption when a quarter section is split diagonally by a transportation corridor will be sufficiently high that it will be more economical for the Corporation to simply acquire the whole Quarter. It can then lease out the subdivided parts for what the market will bear. I can appreciate the possibility for

exceptions to this policy in the event that a transportation corridor passes through the corner of a quarter section and cuts off, say, under five acres; then a per acre proration of the previous method would seem appropriate.

To the extent that the transportation corridor isolates tracts of land, particularly tracts which may be enclosed between the corridor and the Company's mining operations, again an appropriate solution would seem to be for the Corporation to take the land on the same terms as previously discussed. This implies that it would be very desirable for S.P.C. to attempt to acquire a contiguous "block" of land. If S.P.C. does not elect to do this, compensation for irregular field sizes and for extra remoteness of farming operations isolated by the corridor would appear to be in order if a spirit of fairness is to prevail.

Compensation for Buildings

There is no question that where established farm sites are taken, or rendered substantially less useful by virtue of the taking of adjoining lands or enclosure with the transportation corridor, replacement compensation should be offered.

I would suggest two simplifications to the procedures which have been discussed. One of these would be to apply a multiplier to the value of the relocated house or shelterbelt to compensate the owner for his own work in moving, resettling, landscaping, and labour associated with transplanting the shelterbelt. An override of 25% does not seem unreasonable to me but I admit that this is somewhat arbitrary. However the determination of an override would have the possibility of precluding misunderstandings, which could run over a long period of some time, about the appropriate piecemeal compensation of a landowner for his own work.

I would also suggest that a distinction be made between buildings and improvements which have been used and those which have not. If a building has been

used for grain storage within the last three years I would suggest that its usable bushel capacity be determined and that the owner simply be offered the cash value of replacement steel bin space; I would imagine that this would run to about 60¢ or 70¢ per bushel. If the building had been unused during that period and appeared to be in abandoned condition, I do not believe any compensation should be offered beyond giving the owner the right of salvage. I am inclined to believe that this approach, which admittedly may overcompensate for some buildings and undercompensate for others, would be a rather "clean" approach. It would avoid some economic wastage, such as expenses incurred in moving buildings of dubious value, and disputes over issues such as "depreciated value". Of course, when S.P.C. paid for replacement of a building it would obtain salvage rights on the building.

This same approach might extend to buildings used for storage and for livestock shelter. If a building had been effectively used for storage or livestock shelter (I suggest defining "effectively" as meaning that it had housed contents worth its replacement value) payment for replacement storage should be offered. For open livestock storage, compensation based on an erected pole building could be offered. For other storage a square-footage compensation based on the cost of replacement quonset-type storage could be provided. (This would probably run between $3 and $4 per square-foot.)

With respect to houses, a house lived in within the last three years should qualify for replacement with an appropriate override. Moving of an existing house should be done if mutually acceptable. If the house is of modern style, the cost of replacement of new housing should be provided; if the house is of an older style, and the parties agree that the existing house should not be moved, an <u>ad hoc</u> determination of the cost of providing the owner with housing of equivalent serviceability in a location of his choice will have to be made.

Compensation for Dispersal of Livestock and Disruption of Water Supply

I am inclined to believe that the $100/acre compensation for "other things" should cover this, but I must admit to having very little knowledge about the livestock business. With respect to the disruption of wells, I would assume that a mutually satisfactory restoration of water service for affected parties will have to be provided, or the basis for a separate and possibly very substantial legal dispute will remain.

Closing Arrangements

In the event that the parties in this mediation reach an agreement I can see an advantage to having arrangements completed immediately after the end of 1977. This would provide landowners desiring to make replacement purchases with a 2 year period for replacement of land without capital gain tax, under tax "rollover" provisions.

An option arrangement would seem satisfactory to maintain the terms of the agreement if one is reached. An option payment of 10%, applicable on the final settlement, has been suggested and this seems fair.

If a closing date at the first part of 1978 is agreed to it would seem appropriate for monies for land purchase and other compensation to be paid at this time.

Respectfully,

G.A. Numey, Chairman
Department of Finance
& Management Science.

GAN:js

Cost of Farming Land

An Extra 5 Miles Away, 10 Miles Round Trip

(Per Quarter Section)

ASSUMPTIONS: Rotation of 2 years' crop, 1 year fallow. Yield loss of 1 bushel per acre on crops due to interference in farming practice from inconvenience, etc. Compensation for 10 year period.

Extra crop year work	Time (mins.)
20 inspection trips, etc., with pickup truck @ 20 mins. (30 m.p.h.)	320 (pickup)
2 trips with tractor and spring work equipment @ 50 mins. (12 m.p.h.)	100 (tractor)
2 load/unload time for drills @ 30 mins. tractor time	60 (")
2 trips hauling seed and fertilizer with truck @ 30 mins. (20 m.p.h.)	60 (truck)
1 combine trip @ 50 mins. (12 m.p.h.)	50 (combine)
1 swather trip @ 75 mins. (8 m.p.h.)	75 (swather)
1 fall cultivation @ 50 mins.	50 (tractor)
10 fall truck trips @ 30 mins.	300 (truck)

Extra summer fallow work	
5 tractor trips @ 50 mins.	250 (tractor)
15 pickup trips @ 20 mins.	300 (pickup)

Additional cost item/$1 per acre extra spraying cost during crop year (approximate extra cost for aerial application)

Estimated custom cost rates for equipment with operator

Pickup truck	$10
Tractor (and implement)	25
Truck	20
Combine	40
Swather	12

Extra costs during crop year

Extra time costed out on above rates	*$329.00*
Premium of 35% to compensate for inadequacy of custom rates during peak season, possible equipment modifications (e.g., purchase of drill transport), other detriments such as safety considerations with younger operators at remote locations	*115.00*
Total extra time & premium	*$444.00*
Additional spraying cost	*160.00*
Crop loss, 160 A @ 1 bu. @ $3	*480.00*
	$1084.00

Extra cost during fallow year	*$*
Extra time	*154.00*
Premium @ 35%	*54.00*
Extra time & premium	*$208.00*

Weighted average annual cost,	*$*
2/3 crop @ 1084, 1/3 fallow @ 208	*792.00*
Reduction for tax deductibility, 40%	*317.00*
Annual after tax cost	*$475.00*
10 year undiscounted annual cost (effect of futurity offset by inflation) per quarter section	*$4750.00*
Per acre basis	*30.00*